

## **Attachment 7. Technical Justification of Projects**

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## Acronyms

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AFY	acre-feet per year
AVA	American Viticulture Area
Basin Plan	Water Quality Control Plan for the Central Coastal Basin
BMP	Best Management Practices
CBSM	Community Based Social Marketing
CCWA	Central Coast Water Authority
CDPH	California Department of Public Health
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CIP	Capital Improvement Projects
CN	Composite Runoff Curve Number
Conservation Districts	Coastal San Luis and Upper Salinas Las Tablas Resource Conservation Districts
County	San Luis Obispo County, County of San Luis Obispo
CSA 16	County Service Area No. 16
CSD	Community Services District
CWC	California Water Code
DACs	Disadvantaged Communities
Delta	California Bay-Delta
District	San Luis Obispo County Flood Control and Water Conservation District
DPHS	Department of Public Health and Safety
DWR	California Department of Water Resources
EIR	Environmental Impact Report
GIS	Geographic Information Systems
GPCD	gallons per capita per day
GPD	gallons per day
GPM	gallons per minute
GWMP	Groundwater Management Plan
IRWM	Integrated Regional Water Management
IRWMP	Integrated Regional Water Management Plan
IRWMP, IRWM Plan	San Luis Obispo County Integrated Regional Water Management Plan
LRM	Load Reduction Modeling
MGD	million gallons per day
MHI	median household income
MOU	Memorandum of Understanding
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resource Conservation Service
Paso Basin	Paso Robles Groundwater Basin
ppm	parts per million
PRGBMP	Paso Robles Groundwater Basin Management Plan
Proposal, SLO Proposal	San Luis Obispo Regional Integrated Water Management Proposal

## **Acronyms, Continued**

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PVC	polyvinyl chloride
RCD	Resource Conservation District
Region	San Luis Obispo County IRWM Region
Regional Agency	San Luis Obispo County Flood Control and Water Conservation District
RMS	Resource Management Strategies
RWMG	Regional Water Management Group
RWQCB	Central Coast Regional Water Quality Control Board
SEP	Supplemental Environmental Project
SMCSD	San Miguel Community Services District
SSCSD	San Simeon Community Services District
STAC	Stakeholder and Technical Advisory Committee
SWP	State Water Project
SWP	Statewide Priorities (only in Attachment 9)
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Loads
UCCE	U.C. Cooperative Extension
USFWS	U.S. Fish and Wildlife Service
WRAC	Water Resources Advisory Committee
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

## Chapter 1. INTRODUCTION AND REGIONAL DESCRIPTION

### 1.1 INTRODUCTION

Attachment 7 provides the technical justification for the San Luis Obispo Regional Integrated Water Management Proposal's projects' claimed physical benefits. This attachment begins with a description of the water supply, water quality, environmental, and economic conditions in the San Luis Obispo IRWM region. The regional conditions provide the background and setting necessary to form the basis of the projects' needs and benefits claimed. As a foreword summary to the attachment, **Table 1-1** is introduced early-on as a reference table and to assist in recognizing the projects and the basis for the benefits being introduced throughout the Proposal.

The description of regional conditions is followed by individual project technical justifications. This attachment becomes a central resource document for the Proposal in describing the projects from different viewpoints, leading up to the physical benefits claimed by each.

**Table 1-1. Proposal's Projects' Descriptions**

Project Name	Project Abstracts
<b>Project 1:</b> City of Paso Robles Lake Nacimiento Water Treatment Plant  <b>Sponsor:</b> City of Paso Robles	A 2.4 MGD capacity Lake Nacimiento potable water treatment plant is currently under design. The City's capital program currently has construction scheduled for FY 2015/2016. Based on the most recent financial projections, securing an additional \$3.15 million in Prop 84 grant funds would allow the timing of the initial plant phase to be accelerated by one year.
<b>Project 2:</b> Attiyeh Ranch Conservation Easement  <b>Sponsor:</b> The Land Conservancy of San Luis Obispo	The purpose of the Attiyeh Ranch Conservation Easement is to preserve the Attiyeh Ranch and prevent the conversion of current rangeland, grazing land and grassland to a more intensive cattle grazing regime, vineyard or parcel-specific development of ranchettes and hobby farms; to protect the long-term sustainability of low intensity livestock grazing and the benefits that occur from livestock grazing; and to ensure continued wildlife, water quality, watershed and open-space benefits from livestock grazing on the 8,300 acre ranch. It is further the purpose of the conservation easement to ensure the Attiyeh Ranch will be retained forever in its agricultural and natural condition and to prevent uses within the ranch that will significantly impair or interfere with the open space, agricultural, and natural habitat values of the ranch. The requested \$2.1 million conservation easement and conservancy related activities will confine the use of the ranch to such activities, including, without limitation, those involving livestock grazing, habitat protection, education and other compatible uses.
<b>Project 3:</b> Livestock & Land Program  <b>Sponsor:</b> The Coastal San Luis and Upper Salinas Las Tablas Resource Conservation Districts	The proposed \$275,000 Livestock and Land Program grant will address natural resource concerns faced by livestock owners by providing education, technical assistance and cost share for implementation of management measures. Water quality improvements will be achieved by giving livestock owners the tools to complete water quality site assessments and to implement Best Management Practices near listed waterways. The behavioral and management practice changes achieved by this program will provide immediate and lasting water quality and watershed improvements by reducing the off-site mobilization of manure, urine and sediments from livestock facilities. The program will make significant progress toward watershed goals listed in TMDLs and watershed plans.



**Table 1-1. Proposal's Projects' Descriptions, Continued**

Project Name	Project Abstracts
<b>Project 4:</b> Shandon State Water Turn-out  <b>Sponsor:</b> San Luis Obispo County for County Service Area 16	With this grant application of \$337,000, San Luis Obispo County (County) is proposing to construct a water turnout facility that will connect the water distribution system for County Service Area 16 (CSA 16) in Shandon, CA to the State Water Project pipeline. The Shandon State Water Turnout Project will allow CSA 16 to access and distribute its existing State Water allocation of 100 acre-feet per year to the community of Shandon, providing increased water supply reliability and relief to the stressed Paso Robles groundwater basin. Connecting Shandon to the State Water system will diversify its supply so that, when available, State Water can be used in lieu of the groundwater basin, and vice versa. The ability to conjunctively use supplies to allow for periods of groundwater basin recovery will reduce the dependence on State Water alone.
<b>Project 5:</b> San Miguel Community Services District Critical Water System Improvements  <b>Sponsor:</b> San Miguel Community Services District	This \$950,000 grant application is seeking funding for six of the highest priority, critical water supply projects. The six projects will ensure continued reliability of the minimum quantity of potable water delivered, augment inadequate water supply system pressure to prevent loss of system integrity and to maintain adequate fire protection flows and replace or rehabilitate water supply wells that have exceeded their useful life. The San Miguel Community Services District (SMCSD) needs to implement all six of these identified projects in the immediate future, or they will be faced with continued deterioration of an already deficient water system, and may not be able to support even limited beneficial growth with the identified deficiencies that face the District's water system. The majority of the District's residents are low-income households, meeting the criteria as a Disadvantaged Community (DAC). These projects help meet the critical water supply and water quality needs of the DAC.
<b>Project 6:</b> San Simeon Supplemental Water Feasibility Study and Design Project  <b>Sponsor:</b> San Simeon Community Services District	This project is submitted under the Expanded Project Eligibility allowance based on the DAC status of the San Simeon Community Services District (SSCSD) service area and the critical water supply, water quality, and water system improvements needed to provide safe, reliable drinking water and fire protection. SSCSD is pursuing a \$700,000 supplemental water supply feasibility study and design project to increase safe sustainable water supplies from the small Pico Creek groundwater basin which is dependent on the local watershed to recharge and protect the basin each year, especially during extended drought conditions.

## 1.2 REGIONAL DESCRIPTION
















The region covered by the San Luis Obispo Regional Integrated Water Management Proposal (Proposal) is made up of the boundaries of the San Luis Obispo County Flood Control and Water Conservation District (District) and is the same as the County of San Luis Obispo (see **Figure 1-1**). The County's 3,304 square miles can be broken down further into the North Coast Sub-Region (**Figure 1-2**), the North County Sub-Region (**Figure 1-3**), and the South County Sub-Region. The sub-region scale differentiates the local issues and allows for meaningful, focused stakeholder involvement.

The region has shown to be committed to water resource management with the earlier development and adoption of the 2007 San Luis Obispo IRWMP, and is now represented by the many stakeholders involved in the 2013 update to the IRWMP. The following five IRWMP water resource management programs, including a brief purpose statement, make up the framework for successful regional management:

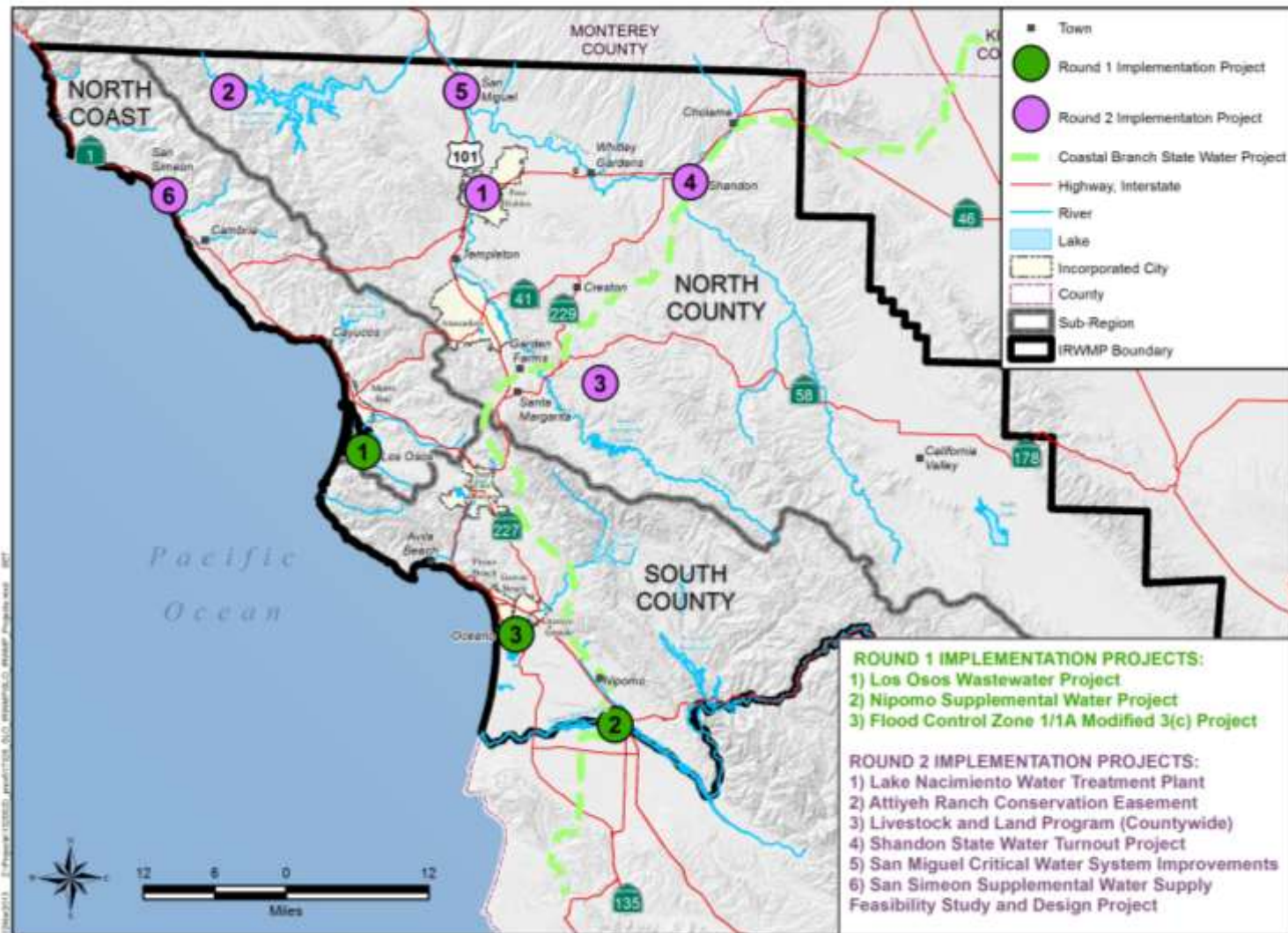
1. **Water Quality** – protecting source water quality and meeting drinking water standards
2. **Water Supply** – providing reliable and sustainable water supplies
3. **Ecosystem Preservation and Enhancement** – providing high quality water for the region through watershed protection and reduced stress on the natural water resources to preserve and enhance the ecosystem
4. **Groundwater Monitoring and Management** – ensuring the region’s groundwater resources remain suitable and sustainable for their continued use
5. **Flood Management** – addressing flood protection through drainage control, financing, and public education

In 2011, the San Luis Obispo Region won a Proposition 84 Round 1 Implementation Grant with three projects shown in **Figure 1-1**. The projects included in this Round 2 Technical Justification (Attachment 7 of the Proposal) are of equal importance to the region and especially to the local jurisdictions that hold the responsibility of implementation and who realize the physical benefits the greatest. **Table 1-2** illustrates how the Round 2 projects align with the adopted region programs.

**Table 1-2. San Luis Obispo Round 2 Implementation Grant Projects and Benefits**

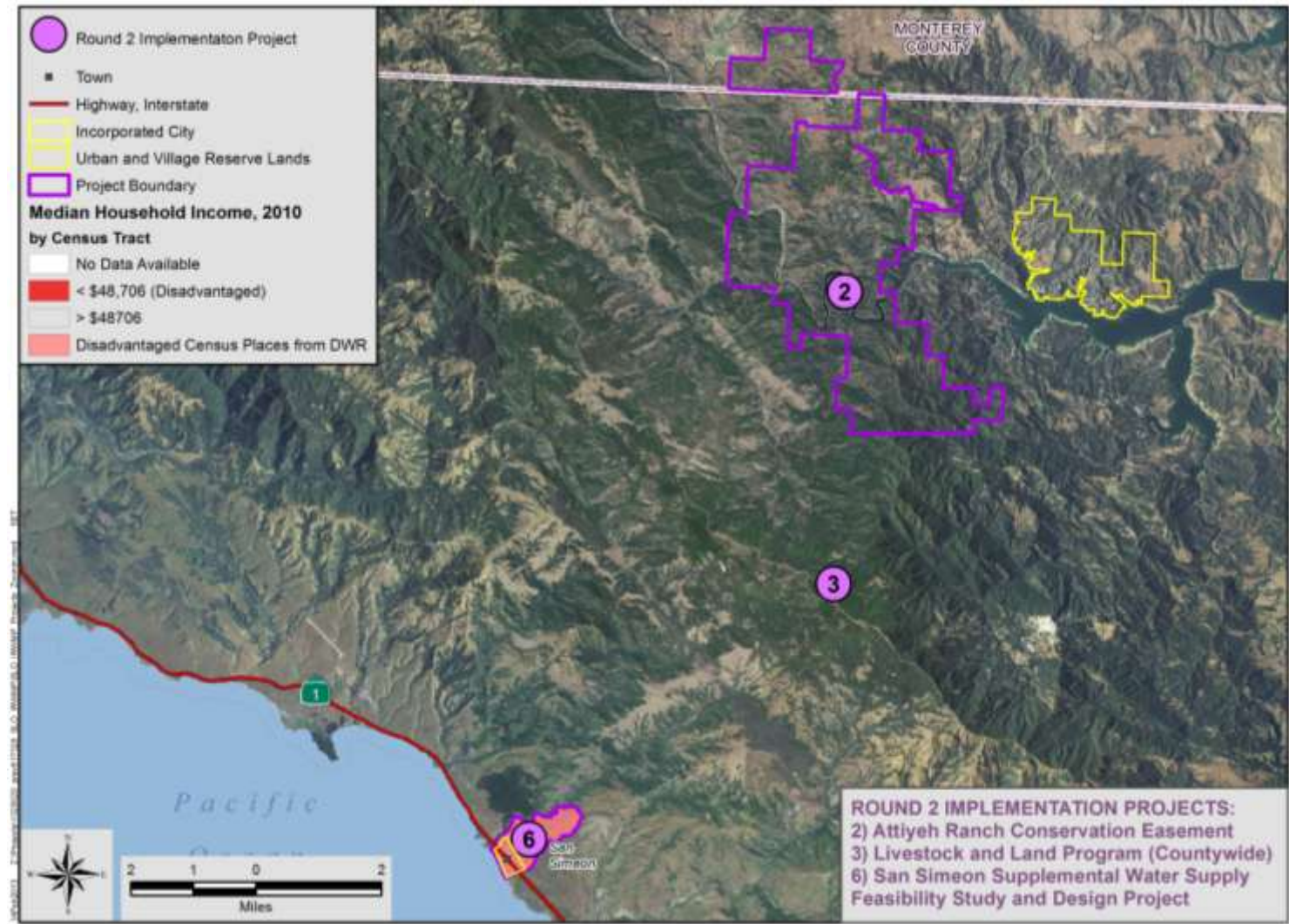
IRWM Programs	Projects					
	City of Paso Robles Lake Nacimiento Water Treatment Plant	Attiyeh Ranch Conservation Easement	Livestock & Land Program	Shandon State Water Turnout	San Miguel Community Services District Critical Water System Improvements	San Simeon Supplemental Water Feasibility Study and Design Project
Water Quality						
Water Supply						
Ecosystem Preservation and Enhancement						
Groundwater Monitoring and Management						
Flood Management						

**Table 1-2** clearly indicates that each of the projects has a benefit to the region and meets one or more of the region’s IRWM goals, with the majority having greater than two. The projects in this Round 2 Proposal are also shown in **Figure 1-1** to provide geographic context to County subregions where grant funded projects are needed. These projects are also shown in **Figure 1-2** and **Figure 1-3** along with the represented benefit areas of each.



**Note:** Round 2, Project 3 is a county-wide program. The call out location is placed in the center of the displayed region.

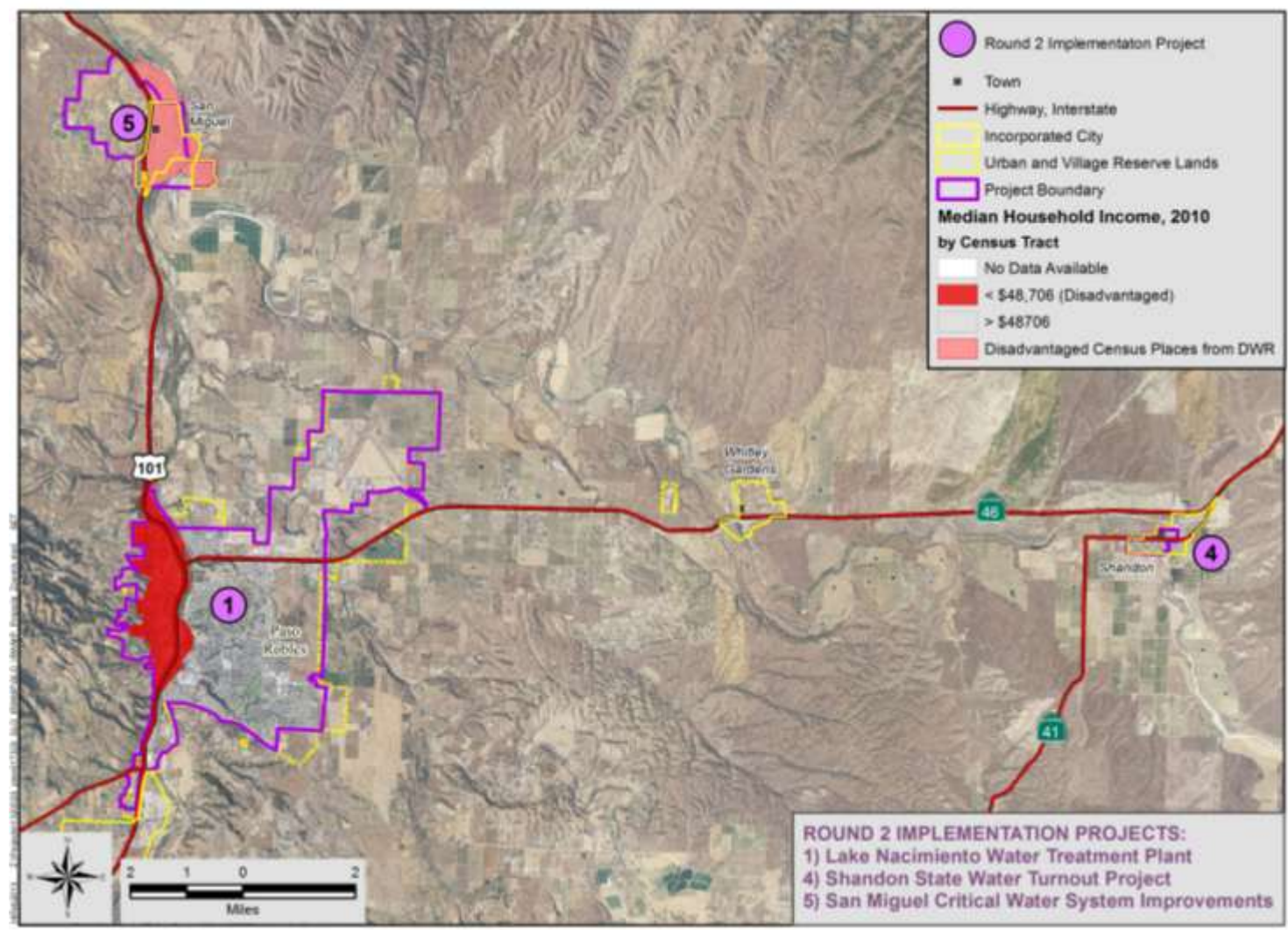
Figure 1-1. *San Luis Obispo County and Three Subregions*



**Note:** Round 2, Project 3 is a county-wide program. The call out location is placed in the center of the displayed region.

Figure 1-2. *North Coast Region*





**Note:** Round 2, Project 3 is a county-wide program. The call out location is not displayed on this figure.

Figure 1-3. **North County Region**

The remainder of this section will describe how the projects align with the following regional elements:

- Water Quantity – available groundwater supplies
- Regional Infrastructure – major water resource projects
- Water Quality – pollutant inventory and project solutions
- Water Reliability – opportunities for new reliable water supplies
- Environmental Resources – protection of the environment
- Region Demographics – recognition of disadvantaged communities

### ***1.2.2 San Luis Obispo Regional Integrated Water Management Proposal***

Defining the larger region as the County has enabled the Regional Agency (the San Luis Obispo County Flood Control and Water Conservation District) and stakeholders to use existing infrastructure, management systems, funding mechanisms, partnerships, and planning documents as a scaffold upon which to build the IRWM and then decide as a region the integrated projects needed to sustain each of the sub-regions. This approach has resulted in an effective, synergistic, and efficient approach to regional water resource management that provides an overarching framework for sound and sustainable water management strategies.

## ***1.3 WATER QUANTITY IN THE REGION***

Water quantity in this case means the volume of water available as stored groundwater in the region. Groundwater is a major water resource element in the region and is recognized as requiring protection and immediate measures to halt the continued decline in elevations.

The discussion of groundwater in the region is broken down into a regional assessment to speak to the larger water resource picture, and then a narrower assessment of how those portions of the San Luis Obispo Region are influenced and benefited by the Proposal's projects.

### ***1.3.1 Regional***

The quantity of water resources within the San Luis Obispo Region include surface waters, groundwater, reclaimed water, imported water, and desalted water and are described in the Master Water Plans, Urban Water Management Plans, Land Use Planning documents, and other Resource Management Reports developed by agencies, organizations and stakeholders within the region, the California Department of Water Resources (DWR), and the Central Coast Regional Water Quality Control Board (RWQCB), as listed throughout. The communities within the San Luis Obispo Region obtain almost 80 percent of their water from groundwater supplies and about 20 percent from reservoirs.

Groundwater levels in the San Luis Obispo groundwater basins are generally highest during the wet season, steadily decline from these levels during the dry season, and recover again to higher levels during the next wet season. Constraints on water availability in the basins include both physical limitations and water quality issues. Shallow alluvial deposits for these basins are

typically more susceptible to drought impacts than deeper formation aquifers, since they have less groundwater in storage. Significant lowering of basin groundwater levels at or below sea level near the coast can lead to seawater intrusion and degradation of water quality in both shallow and deep aquifer zones. For the upper basin, water level and well capacity declines during extended drought periods will limit water availability, while in the lower valley area, sea water intrusion and petroleum hydrocarbon contamination are the primary constraints.

### **1.3.2 Proposal Areas**

The Paso Robles Groundwater Basin is the primary shared water source for municipal, rural residential users, and the extensive agricultural lands in the North County Subregion of San Luis Obispo County. Many well owners, including the City of Paso Robles, have suffered a significant reduction in well capacity or had their wells go dry. Monitoring wells in the Paso Robles Groundwater Basin near the community of Paso Robles show continuous declining elevations indicating insufficient groundwater recharge to sustain current annual average extraction yields from both urban and agricultural pumping. In addition, potential and existing groundwater recharge areas will be lost if new growth occurs without the incorporation, identification, and conservation of valuable recharge lands. The result is a significant loss in groundwater storage that can already be seen by the large decline in groundwater elevation difference contours in **Figure 1-4**.

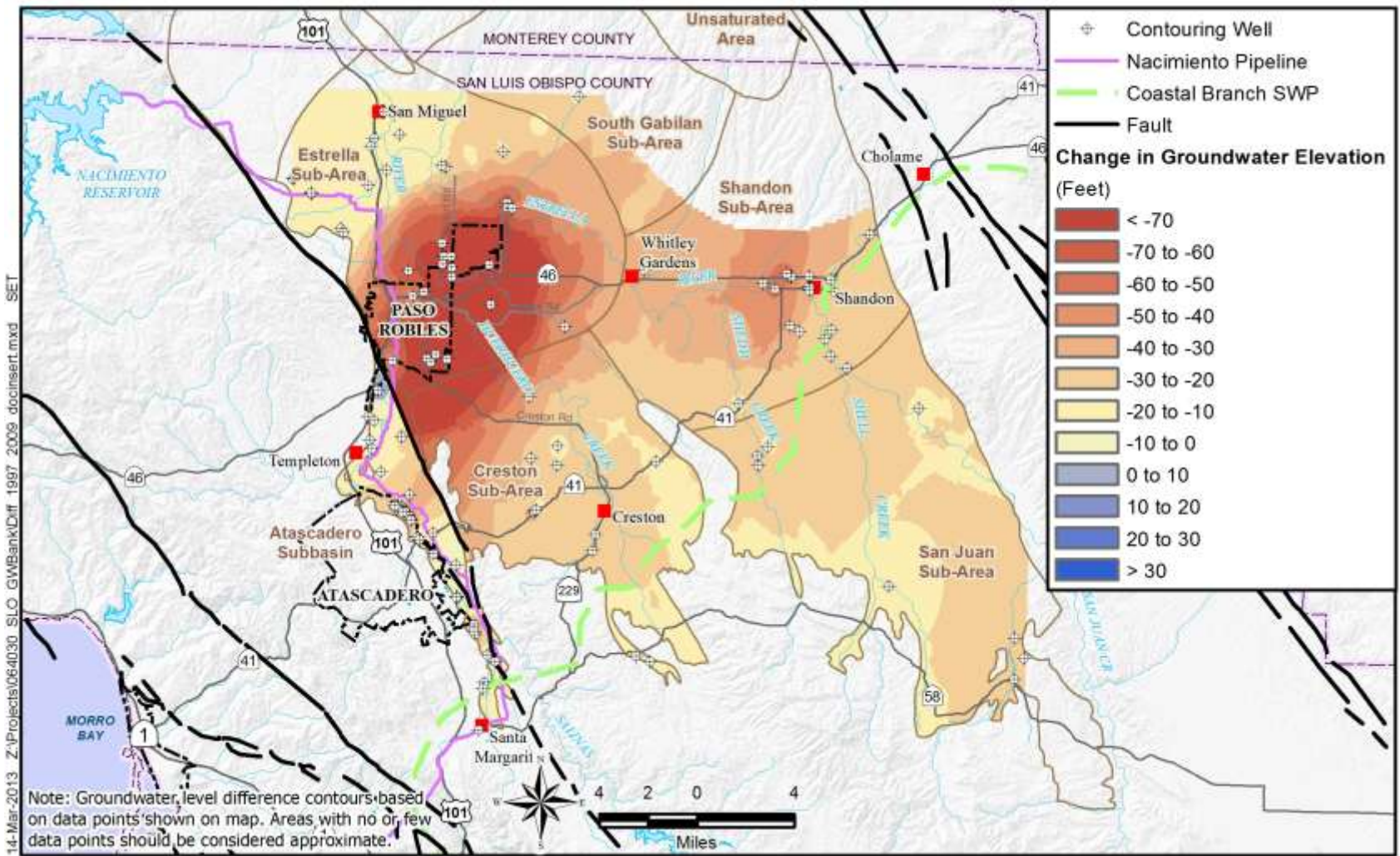


Figure 1-4. *Change in Paso Robles Groundwater Elevations (1997 - 2009)*

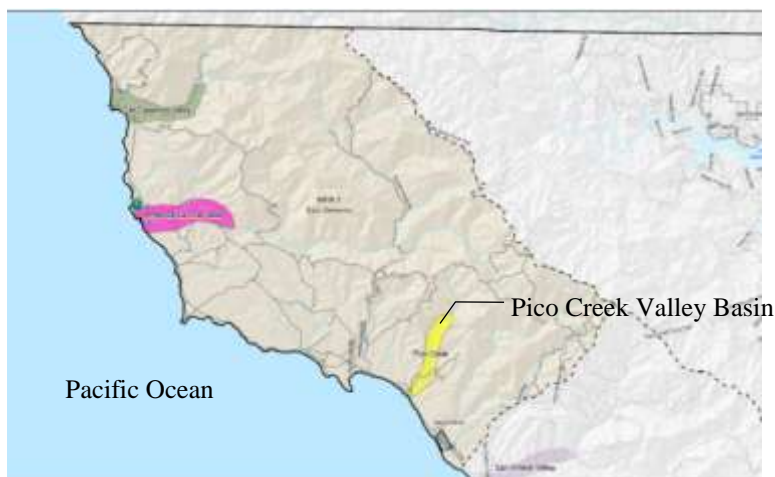


The following two projects included in this grant proposal address water quantity needs in the Paso Basin:

1. City of Paso Robles Lake Nacimiento Water Treatment Plant
2. Shandon State Water Turn-out

In contrast to the Paso Basin, the smaller Pico Creek Valley groundwater basin (see **Figure 1-5**) underlies and is used solely for water supplies to the small disadvantaged coastal community of San Simeon, with a small amount allocated for Hearst Ranch. San Simeon is 100 percent dependent on the local watershed to capture rainfall for recharge of the groundwater basin and to sustain continuous flows in Pico Creek to feed two municipal underflow wells near the creeks outlet to the Pacific Ocean. During dry months and extended drought conditions, San Simeon is without sufficient water to meet peak water demands leaving the community without water for outdoor irrigation and fire flow protection. This water supply need project is titled as follows:

1. San Simeon Supplemental Water Supply Feasibility Study and Design Project



Source: 2012 Master Water Report<sup>1</sup>

Figure 1-5. *Pico Creek Valley groundwater Basin*

## **1.4 REGIONAL INFRASTRUCTURE**

The Region has five regional water supply projects that it currently operates or is implementing for supplying water to residents and businesses in all seven cities and much of the urban unincorporated area. The Region's major water supply infrastructure [illustrated in **Figure 1-6**] is summarized below:

- **Lopez Dam and Reservoir**, which provides drinking water to the cities of Arroyo Grande, Pismo Beach, Grover Beach, the Oceano Community Services District, and San Luis Obispo County Service Area No. 12

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<sup>1</sup> San Luis Obispo County. "Master Water Report, Volume I – III." 2012.

(Avila Beach); downstream releases to the South County Subregion via Arroyo Grande Creek; and recreation activities at the lake.

- **Salinas Dam and Reservoir**, which provides water to the City of San Luis Obispo; downstream releases to the North County Subregion via the Salinas River; and recreation activities at the lake.
- State Water Project, which provides water supplies to the entities listed in Table 1-3.
- **Nacimiento Water Project**, which provides water supplies to some lakeside property owners and delivers raw water supplies to the cities of Paso Robles, Atascadero (via the Atascadero Mutual Water Company), San Luis Obispo, the Templeton Community Services District and County Service Area 10A (Cayucos; via exchange with City of San Luis Obispo allocation of Whale Rock Reservoir). **Whale Rock Reservoir**, which provides water supplies to joint owners: City of San Luis Obispo, Cal Poly University, and California Men's Colony; as well as to additional downstream users: Cayucos, Paso Robles Beach Water Association, Morro Rock Mutual Water Company, County Service Area 10A, and several landowners.
- **Chorro Reservoir**, which provides water storage, treatment and distribution to California Men's Colony, Camp San Luis Obispo, County Operations Center/ Office of Education, and Cuesta Community College.

**Table 1-3. State Water Project Sub-Contractors and Volumes**

Sub-Contractor	Water Service Amount (ac-ft)	Drought Buffer (ac-ft)	Total Reserved (ac-ft)
<b>Chorro Valley Turnout</b>	<b>About \$1,100 per ac-ft</b>		
City of Morro Bay	1,313	2,290	3,603
CA Men's Colony	400	400	800
County OP Center	425	425	850
Cuesta College	200	200	400
<b>Lopez Turnout</b>	<b>About \$1,000 per ac-ft</b>		
City of Pismo Beach	1,240	1,240	2,480
Oceano CSD	750	0	750
San Miguelito MWC	275	275	550
Avila Beach CSD	100	0	100
Avila Valley MWC	20	60	80
San Luis Coastal USD	7	7	14
Shandon	100	0	100
<b>Total</b>	<b>4,830</b>	<b>4,897</b>	<b>9,727</b>

Reference: San Luis Obispo County Website<sup>2</sup>

**Table 1-4** summarizes the quantity of water resources from all sources for the San Luis Obispo Region by Sub-Region.

<sup>2</sup> San Luis Obispo County. "State Water Project".

<<http://www.slocountywater.org/site/Major%20Projects/State%20Water%20Project/>>. March 20, 2013.

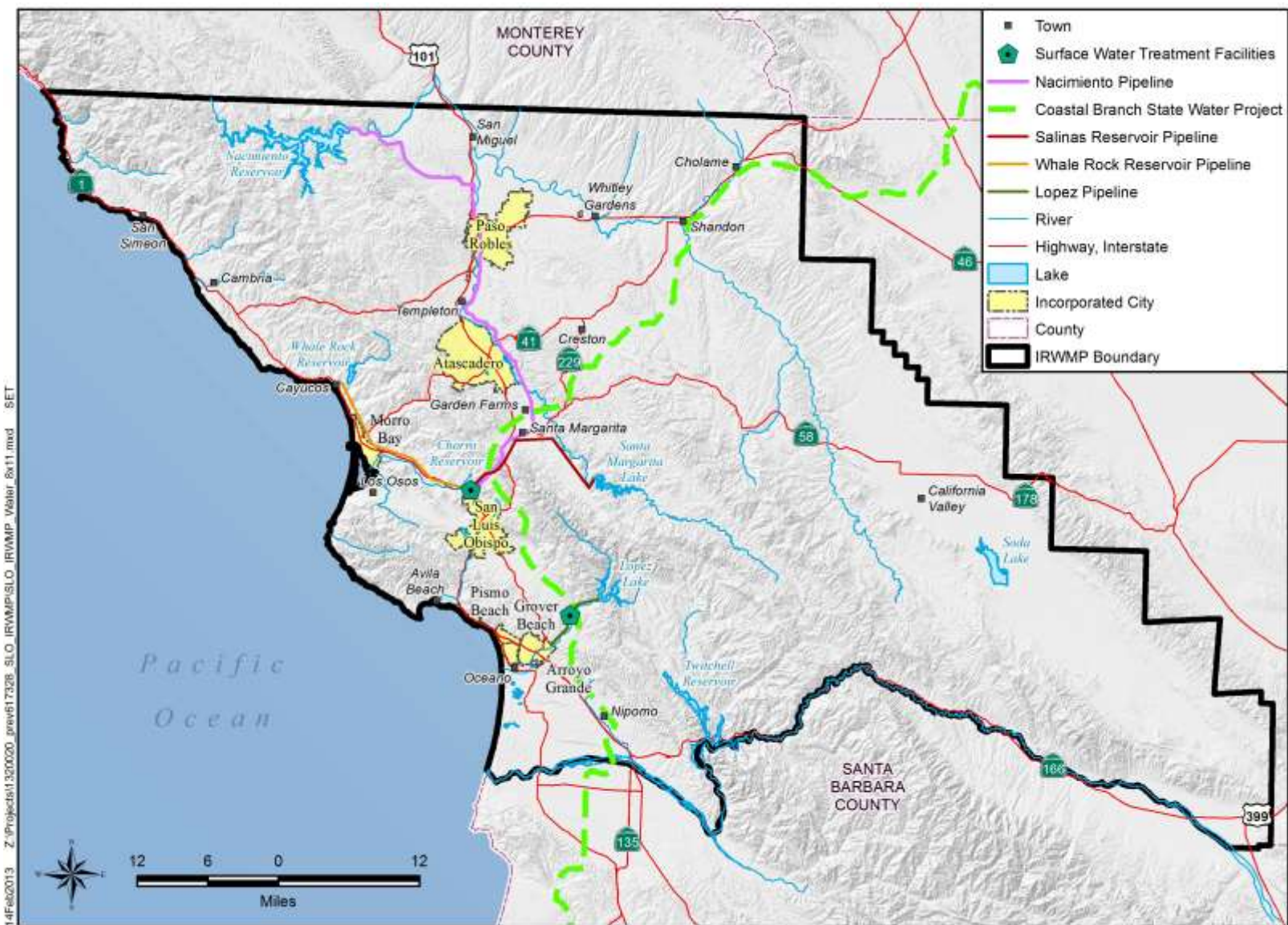


Figure 1-6. *San Luis Obispo Regional Water Supply Infrastructure*

**Table 1-4. Average Annual Water Resource Supplies in San Luis Obispo**

Quantity of Water Resources (ac-ft)					
Sub-Region	Surface	Groundwater	Reclaimed	Imported	Desalted
North Coast	4,680	13,706	275	1,313	645
South County	12,781	214,000	135	2,392	0
North County	6,476	273,700	0	100	0

**Reference:** San Luis Obispo County Master Water Report Volume II, May 2012

The following three projects included in this grant proposal utilize or benefit regional infrastructure:

1. City of Paso Robles Lake Nacimiento Water Treatment Plant
2. Attiyeh Ranch Conservation Easement
3. Shandon State Water Turn-out

## **1.5 WATER QUALITY**

The waters in the San Luis Obispo Region have the good fortune of being exposed to fewer pollutants than many of the urban areas of the State. The region's waters are important in helping sustain numerous ecosystems.

Despite many "first-class" environmental resources, the region also has some notable water quality challenges. Specific wastewater systems have been facing compliance challenges, discussed more fully below, and other areas are exposed to groundwater pollutants from septic systems and other activities.

A more detailed summary of the water quality issues and challenges facing the region are described in the 2007 San Luis Obispo IRWM Plan. **Table 1-5** provides a summary of water quality constituents in the San Luis Obispo Region which is more fully discussed in the 2007 San Luis Obispo IRWM Plan.

The following four projects included in this grant proposal provide water quality benefits to the region:

1. Attiyeh Ranch Conservation Easement
2. Livestock & Land Program - Implement BMPs
3. San Miguel Community Services District Critical Water System Improvements
4. San Simeon Supplemental Water Supply Feasibility Study and Design Project

**Table 1-5. Water Quality Constituents of Concern in San Luis Obispo County Water Resource Supplies**

Quality of Water Resources (ac-ft)					
Sub-Region	Surface Water	Groundwater	Reclaimed	Imported	Desalted
North Coast	Number of 303(d) listed water bodies: • Pathogens - 13 • Nutrients - 8 • Sediments - 3 • Salinity - 1 • Temperature - 1	• TDS • Manganese • Sea Water Intrusion • MtBe • Petroleum Hydrocarbon • Nitrates	Tertiary recycled water is used at the Dairy Creek Golf Course.	State Water Project provides supplementary water throughout the Sub-Region.	Desalination is used as a backup supply source.
South County	Number of 303(d) listed water bodies: • Pathogens - 15 • Nutrients - 10 • Salinity - 6 • Toxicity - 5 • Pesticides - 3 • Sediments - 2 • Metals/Metalloids - 1 • Other Organics - 1 • Misc. Pollutants - 1	• TDS • Nitrates • Salinity • Hardness • PCE • Chlorides • Sea Water Intrusion • Sulfates • Iron • Manganese • Selenium	Tertiary recycled water serves the City of San Luis Obispo golf courses, schools, and parks, as well as for environmental habitat discharge.	State Water Project provides supplementary water throughout the Sub-Region.	Desalination is being considered to augment future water supply.
North County	Number of 303(d) listed water bodies: • Metals/Metalloids - 5 • Pathogens - 3 • Nutrients - 3 • Salinity - 3 • Misc. Pollutants - 2	• TDS • MBAS • Chlorides • Nitrates • Arsenic • Barium • Boron		State Water Project provides supplementary water throughout the Sub-Region.	

**References:** San Luis Obispo County Master Water Report<sup>1</sup>, 303(d) List<sup>3</sup>

## 1.6 WATER RELIABILITY

Since the 2007 San Luis Obispo IRWM Plan, efforts to improve the reliability and quality of the San Luis Obispo Region's water supply have been initiated or completed. The 2007 San Luis Obispo IRWM Plan identified an opportunity for banking water in the Paso Robles Groundwater Basin. This basin is the largest in the County and the Coastal Branch of the State Water Project (SWP) enters the County adjacent to the Paso Robles Groundwater Basin. These two features, along with the County's unused allocation of SWP water, led local water leaders to want to explore the feasibility of recharging the Paso Robles Groundwater Basin through use of treated surface water in-lieu of groundwater.

<sup>3</sup> California Water Boards State Water Resources Control Board. "Water Quality Control Policy, California's Clean Water Act Section 303(d) List." 2004.

The following four projects included in this grant proposal provide water reliability benefits to the region by developing new supplies or optimizing and improving the use of existing supplies:

1. City of Paso Robles Lake Nacimiento Water Treatment Plant
2. Shandon State Water Turn-out
3. San Miguel Community Services District Critical Water System Improvements
4. San Simeon Supplemental Water Supply Feasibility Study and Design Project

## **1.7 ENVIRONMENTAL RESOURCES**

The importance of environmental resources to the cultural and social values of the San Luis Obispo Region is extremely high. The San Luis Obispo Region has focused many of its land use policies on sustainability and “living within our means,” and growth management ordinances (discussed subsequently under “relation to local planning”) have long been established to provide a balance between economic development and preservation of agricultural and natural resources.

In addition to the region’s natural resources and environmentally minded cultural values, the region’s culture is also strong in community values. Without the urban sprawl common in many regions of the State, the Region’s character and social values are apparent in the individual communities. Geographical separation between cities and towns within the region help support their unique identities. The “North County,” the “North Coast,” and the “South County,” are sub-regions that are well known for different identities just as the cities and towns are known with unique identities. The mixture of agricultural, environmental, educational, professional, crafts and trades, and other interests truly reflects a region that is culturally and socially rich with their differences, but common in pursuing a good “quality of life.”

The following two projects included in this grant proposal protect or enhance the environmental resources in the region:

1. Attiyeh Ranch Conservation Easement
2. Livestock & Land Program - Implement BMPs

## **1.8 REGION DEMOGRAPHICS**

The total population of San Luis Obispo County was 269,637 in 2010, which represents a 2% population increase since the 2007 San Luis Obispo IRWM Plan. A summary of the common demographic metrics<sup>4</sup> is provided in **Table 1-6** for the seven cities of San Luis Obispo County. Although personal income and wealth have been rising in San Luis Obispo County, poverty still exists. **Figure 1-7** shows the region’s disadvantaged incorporated and unincorporated communities whose median household income is less than 80% of the median household income

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<sup>4</sup> US Census Bureau. “2010 ACS 5-year Estimates.” 2010. <https://ask.census.gov/faq.php?id=5000&faqId=519>



(\$48,706) for all of California. Additional demographic information can be found in the following table.

The following two projects included in this grant proposal provide critical water supply and water quality benefits for Disadvantaged Communities in the region:

1. San Miguel Community Services District Critical Water System Improvements
2. San Simeon Supplemental Water Supply Feasibility Study and Design Project

**Table 1-6. City Demographics of San Luis Obispo County**

Demographics for Incorporated Cities in the Region					
City	Total Population	Total Households	Average Household Size	Percent Unemployed	Median Household Income
Arroyo Grande	16,990	7,051	2.37	7.2	\$58,725
Atascadero	27,981	10,453	2.43	7.6	\$65,479
Grover Beach	13,137	5,206	2.52	6	\$49,010
Morro Bay	10,255	4,646	1.98	3.7	\$53,585
Paso Robles	28,794	10,766	2.67	7.6	\$57,459
Pismo Beach	7,802	3,761	2.05	5.6	\$63,702
San Luis Obispo	44,959	19,734	2.21	8.5	\$40,812

**Reference:** US Census Bureau, 2010 ACS 5-year estimates

## **1.9 ROUND 2 PROJECT SYNERGIES IN OVERCOMING PROGRAM CHALLENGES**

**Table 1-7** provides the essential understanding of how each of the Round 2 Projects, in some way, benefits the region and creates synergies in meeting one or more of the region’s challenges discussed above and later in the concluding chapter titled, “Project Synergies.” This table provides an important understanding of why the Round 2 projects were selected as being the highest priority based on the region’s successful implementation of the 2007 San Luis Obispo IRWM Plan. Their technical justification, relationship with the IRWM Program Objectives, and quantified physical benefits are described in much greater detail in the subsequent chapters of Attachment 7.

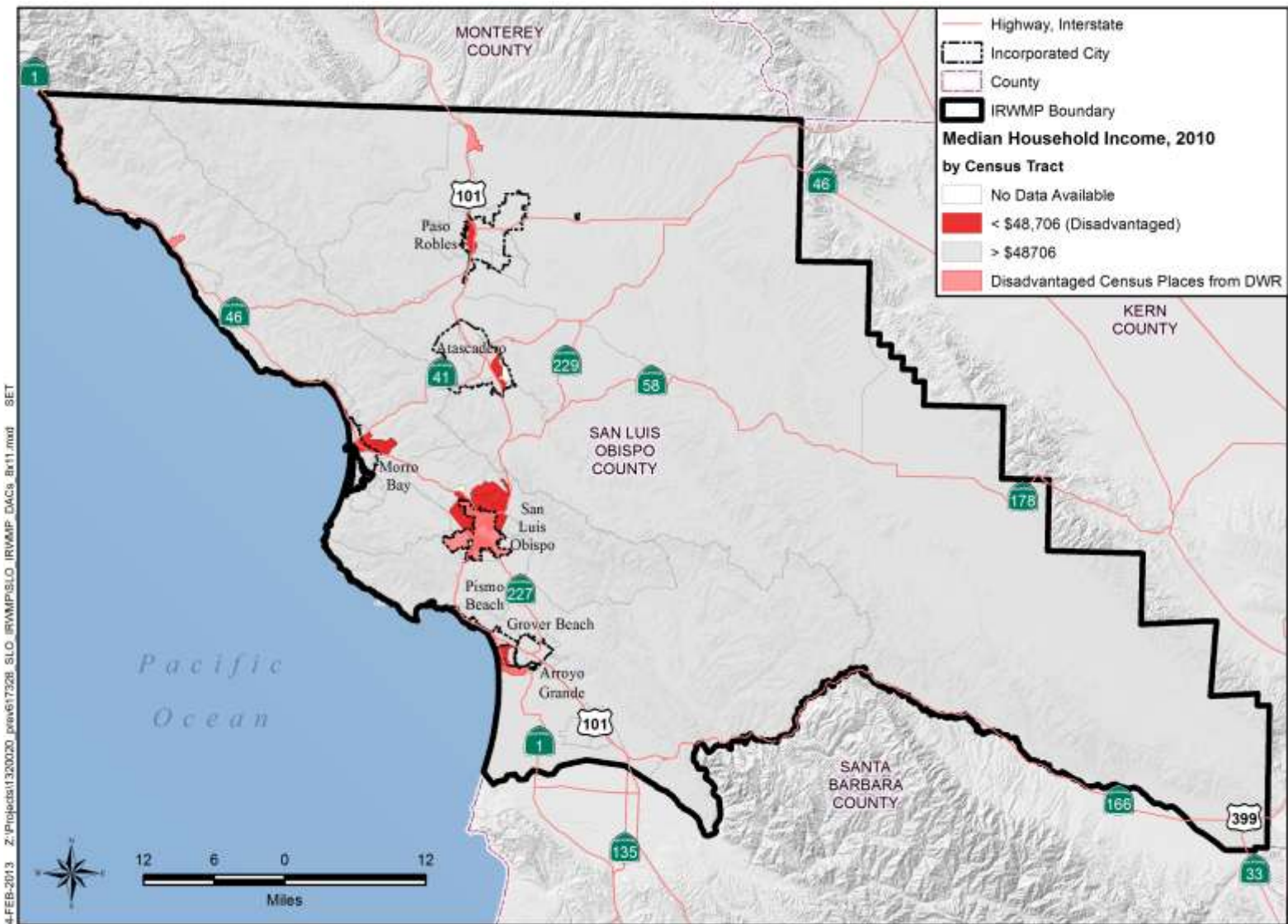


Figure 1-7. *Disadvantaged Communities of San Luis Obispo County*



**Table 1-7. Important Facts and Common Challenges Addressed by Round 2 Projects**

Project Name	Brief Project Description	San Luis Obispo Water Resource Challenges				
		Groundwater Management	Watershed Management	Drinking Water from Surface Water	Water Resources Management	DAC Drinking Water
City of Paso Robles Lake Nacimiento Water Treatment Plant	Construction of a 2.4 mgd surface water treatment plant.	Provides much needed in-lieu recharge of the Paso Basin near the most impacted areas of the basin.		Makes use of the region's Nacimiento apportionment of surface water.	Provides sufficient redundancy in the Paso Robles' water system to optimize conjunctive use operations	Portions of Paso Robles are considered to be DAC's.
Attiyeh Ranch Conservation Easement	Acquisition of a conservation easement to protect land in perpetuity.	Protects the overlying recharge areas of local groundwater basins and reduces recharge of poor quality water.	Prevents urbanization thereby protecting the local watersheds from soil erosion and contamination.		Protection of down-gradient surface and groundwater supplies for use by urban communities	
Livestock & Land Program - Implement BMPs	County-wide program for managing contamination from livestock facilities.	Reduces the potential for contamination of groundwater from manure, urine and sediments from livestock.	County-wide program to protect local and regional contamination and soil disturbance from livestock activities.			
Shandon State Water Turn-out	A new turnout on the State Water Project pipeline to receive already allocated 100 AFY of State Water Project.	Provides in-lieu recharge opportunities by providing water to both agriculture and urban water systems, reducing use of basin.		Makes use of the region's State Water Project allocation of surface water.	Provides redundancy in the Community of Shandon's potable water system and to agriculture for optimization of conjunctive use practices.	Surface water delivered to the Paso basin in-lieu of groundwater use provides benefits to small DACs where groundwater is the only affordable water supply.

**Table 1-7. Important Facts and Common Challenges Addressed by Round 2 Projects, Continued**

Project Name	Brief Project Description	San Luis Obispo Region's Challenges				
		Groundwater Management	Watershed Management	Drinking Water from Surface Water	Water Resources Management	DAC Drinking Water
San Miguel Community Services District Critical Water System Improvements	Upgrading of a small community water system.					Upgrades to DAC groundwater system within the Paso Basin where water quality degradation is occurring.
San Simeon Supplemental Water Supply Feasibility Study and Design Project	A study to support the design of a supplemental water supply project.	San Simeon overlies a small groundwater basin where studies of the groundwater behavior can optimize safe and sustainable groundwater yields.	Watershed studies can look at preserving groundwater recharge areas, improving surface water quality and capturing stormwater runoff for recharge.	San Simeon has a surface water right that can be balanced with groundwater rights to meet their water supply requirements.	Studies can identify through feasibility analysis which alternative supplies and programs will optimize the available water resources, including recycled wastewater.	Studies of supplemental water supplies for a DAC currently subjected to poor water system reliability, insufficient annual volumes and salinity impacts from the ocean.

## Chapter 2. PROJECT SPECIFIC TECHNICAL JUSTIFICATIONS

Chapter 2 of Attachment 7 – Technical Justification will describe the setting leading up to the need, selection, and benefits for a clear understanding of the projects. The Proposal's suite of six (6) projects offers a wide range of project types and physical benefits, also making Attachment 7 the most critical of attachments for project understanding.

The technical justification for each project will be presented in the following format:

- **Project Need:** recent and historical conditions that demonstrate the project need and provide background for benefits to be claimed.
- **Project Development and Selection:** discussion of project alternatives that were considered and justification for selected alternative.
- **Project Description:** acknowledgement of all new facilities, policies, and actions required to obtain the physical benefits.
- **Project Physical Benefits:** expected measurable accomplishments of the project including quantified estimates of physical benefits, description of methods used to estimate physical benefits, uncertainty of the benefits, and factors that lead to uncertainty.
- **Without Project Conditions:** levels of the physical benefits in the future without the project, but with other projects that might be planned (including Table 9 from the PSP)
- **Potential Adverse Physical Effects:** description of any potential adverse physical effects.

Following the technical justification for each of the projects, there is a description of the relationship of each project to the overall physical benefits of the entire suite of projects in the San Luis Obispo proposal.

## Project 1. City of Paso Robles Lake Nacimiento Water Treatment Plant

The City of Paso Robles is located in northern San Luis Obispo County (North County), on the eastern, inland side of the Santa Lucia Mountains. Paso Robles is situated on the upper Salinas River (see **Figure 2-1**), which flows north toward Monterey County. Incorporated in 1889, the City of El Paso de Robles (Paso Robles) now encompasses a total area of 11,985 acres on both sides of the Salinas River. The City also is situated on the western margin of the Paso Robles Groundwater Basin, which is the water-bearing portion of the upper Salinas River drainage area.

The City of Paso Robles currently relies on water from two sources: Salinas River underflow wells and groundwater from the deeper formation of the Paso Robles Groundwater Basin. Significant groundwater level declines in City wells and other basin wells have been occurring since the 1990's. San Luis Obispo County has certified the basin as a Level of Severity III, indicating the demand for water will equal or exceed its supply before supplemental supplies can be developed. The Lake Nacimiento Water Treatment Project will provide additional potable water for the City of Paso Robles, enabling the City to reduce groundwater pumping within the overdrafted Paso Robles Groundwater Basin.



Figure 2-1. *Location Map City of Paso Robles*

## 1.0 Project Need

Paso Robles has a semi-arid, Mediterranean climate characterized by hot sunny summers and cool winters. Because of its inland location, the influence of fog and maritime breezes is less pronounced than in South County cities such as San Luis Obispo. Precipitation on the Paso Robles Groundwater Basin area ranges from an annual average of 16 inches or more in the west to less than 10 inches in the east. The long-term average annual rainfall is 14.86 inches and most of the precipitation occurs in the winter months (November through April).

**Table 2-1** below shows the City of Paso Robles's population in 2005 and 2010 along with projections to the year 2035 in five year intervals. In December 2003, the City approved a residential population planning threshold of 44,000 residents by the year 2025. For the UWMP, the population was assumed to remain stable between 2025 and 2035 reflecting buildout conditions and the planning threshold of 44,000 residents.

**Table 2-1. City of Paso Robles Population - Current and Projected**

Population - Current and Projected							
	2005	2010	2015	2020	2025	2030	2035
<b>Service Area Population<sup>1</sup></b>	27,361	30,072 <sup>2</sup>	30,770 <sup>3</sup>	37,385 <sup>4</sup>	44,000 <sup>5</sup>	44,000 <sup>5</sup>	44,000 <sup>5</sup>

1. Service area population is the population served by the distribution system and is approximately the same as the City population.

2. 2010 population from State Department of Finance's population estimate for 1/1/2010. Accessed 8/25/10, <http://www.dof.ca.gov/research/demographic/reports/estimates/e-1/2009-10/>.

3. Projected customer growth between 2010 and 2015 = 262 accounts (derived from City of Paso Robles, Supplemental Report Section - 2010 Uniform Water Rate Study, K/J, 11/22/10). Take half of FY2010-11 and half of FY2015-16 and assume 1 account per household and 2.663 people per household  $[30,072 + (262 \times 2.663 \text{ pph}) = 30,770 \text{ (rounded)}]$ . Value of 2.663 people per household from City of Paso Robles General Plan Housing Element: 2009 Update.

4. Assumes linear growth between 2015 and 2025.

5. City's 2003 General Plan Amendment 2005-001 (City Council Resolution 05-249); City population in 2025 consistent with General Plan population planning threshold of 44,000 residents.

**Source:** City of Paso Robles 2010 Urban Water Management Plan<sup>5</sup>

The City of Paso Robles currently relies on water from the Salinas River underflow wells and groundwater from the deeper formation of the Paso Robles Groundwater Basin. Groundwater use in the Paso Robles Groundwater Basin (basin) is at, or exceeds the basin's perennial yield. San Luis Obispo County has designated the basin as a Level of Severity III, indicating the demand for water will equal or exceed its supply before supplemental supplies can be developed. Declining water levels in extensive areas of the Paso Robles Groundwater Basin were documented in the Paso Robles Groundwater Basin Management Plan, March 2011<sup>6</sup>.

<sup>5</sup> City of Paso Robles. "Paso Robles Urban Water Management Plan". 2010.

<sup>6</sup> City of Paso Robles. "Paso Robles Groundwater Basin Management Plan." 2011.

City of Paso Robles water deliveries for 2005 and 2010 were 7,163 acre-feet per year (AFY) and 5,749 AFY, respectively. Water deliveries in 2010 were much lower than 2005 deliveries because of mandatory City-wide outdoor water use restrictions implemented in 2009. Level 2 of the City's Water Conservation Ordinance and Water Shortage Contingency Plan was implemented to reduce summer peak water demands and thereby manage a projected water production shortfall of 20 percent. These restrictions will be lifted when the Lake Nacimiento surface water supply becomes usable by Paso Robles. As shown in **Table 2-2** below, the projected customer water deliveries are expected to increase to 12,460 AFY in 2035.

**Table 2-2. City of Paso Robles Water Deliveries - Past, Current and Projected (see footnote 1)**

Past, Current and Projected Water Deliveries														
	2005 <sup>1</sup>		2010 <sup>2</sup>		2015		2020		2025		2030		2035	
Water Use Sectors	# of Accounts	Deliveries (AFY)	# of Accounts	Deliveries (AFY)	# of Accounts	Deliveries (AFY)	# of Accounts	Deliveries (AFY)	# of Accounts	Deliveries (AFY)	# of Accounts	Deliveries (AFY)	# of Accounts	Deliveries (AFY)
Single Family	8,273	3,865	8,661	3,435	8,882	4,441	10,653	5,326	12,425	6,180	12,425	6,180	12,425	6,180
Multi-family	386	794	401	573	502	847	600	1,020	696	1,195	696	1,195	696	1,195
Commercial	682	1,197	676	656	703	1,234	1,383	2,427	2,063	3,620	2,063	3,620	2,063	3,620
Industrial	64	69	71	154	74	161	81	176	89	194	89	194	89	194
Institutional/ Governmental	Included in Other sector	Included in Other sector	76	91	76	91	76	91	76	91	76	91	76	91
Parks, Landscape Irrigation, Other <sup>3</sup>	331	1,238	391	840	392	1,176	393	1,180	393	1,180	393	1,180	393	1,180
Total Water Deliveries <sup>4</sup>	9,736	7,163	10,276	5,749	10,629	7,950	13,186	10,220	15,742	12,460	15,742	12,460	15,742	12,460

1. 2005 accounts and deliveries from 2005 DWR Public Water System Statistics. Other category includes some Industrial and Institutional/Govt water use.

2. 2010 accounts and deliveries from 2010 DWR Public Water System Statistics. 2010 water use was reduced by approximately 20 percent due to City-wide Level 2 mandatory outdoor water use restrictions.

3. Other category on DWR Public Water System Statistic forms includes hydrant meters. In 2005 and 2010, "Landscape Irrigation" category included some accounts that provided water to commercial/industrial and Institutional/Govt water use.

4. Total Water Deliveries from Tables 5 and 15. See Tables 5 and 15 for unaccounted-for water and potential conservation savings.

Note: Projected single family "baseline" deliveries for 2015 to 2025 and beyond are based on the average per account deliveries from 2006-2008.

**Reference:** City of Paso Robles 2010 Urban Water Management Plan<sup>5</sup>

The City of Paso Robles's water supply is subdivided into two sources according to water rights. These are Salinas River underflow and percolating water of the Paso Robles Groundwater Basin. Salinas River underflow refers to shallow groundwater in direct hydraulic connection with the Salinas River. This underflow is subject to appropriative surface water right and permitting by the State Water Resources Control Board (SWRCB). An approved SWRCB application allows the City of Paso Robles to extract up to eight cubic feet per second (cfs or 3,590 gpm) with a maximum extraction of 4,600 AFY (January 1 to December 31). The river wells typically account for approximately half of the City of Paso Robles's current supply (table below).

Since 2005, the City of Paso Robles's use of underflow has ranged between 84% and 99% of the full appropriation; the maximum annual underflow well production was 4,558 AF (2005) and the minimum was 3,868 AF (2009). The City of Paso Robles is considering additional wells near the river to optimize pumping. Future operation of the underflow wells will involve an optimum pumping plan that limits instantaneous flow rates to eight cfs while maximizing the permitted annual production of 4,600 AFY.

The second source of supply for the City of Paso Robles are the twelve wells that extract water from the Paso Robles Groundwater Basin. These wells typically account for less than half of the City of Paso Robles's groundwater supply as shown in **Table 2-3**. The basin is the primary

shared water source for municipal, rural residential users, and the extensive agricultural lands in North County Subregion of San Luis Obispo County. Many well owners, including the City of Paso Robles, have suffered a significant reduction in well capacity or had their wells go dry. The City of Paso Robles has regularly experienced seasonal water supply shortfalls since the mid-2000s. Mandatory summer outdoor water use restrictions have been in place in Paso Robles since 2009. The City of Paso Robles identified the need for supplemental water supplies to meet current and future needs in its 2000, 2005, and 2010 Urban Water Management Plans (plans on file at DWR).

**Table 2-3. City of Paso Robles Groundwater Volume Produced (see footnote 1)**

<b>Groundwater - Volume Produced<sup>1</sup> (AFY)</b>						
<b>Basin</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009<sup>2</sup></b>	<b>2010<sup>2</sup></b>
<b>Paso Robles Basin</b>	2,856	3,366	4,103	3,819	2,794	2,338
<b>Salinas River Underflow</b>	4,558	4,065	4,023	4,072	3,868	3,988
<b>Total Pumping</b>	<b>7,414</b>	<b>7,431</b>	<b>8,126</b>	<b>7,891</b>	<b>6,662</b>	<b>6,326</b>

1. All groundwater produced is metered.

2. Water use in 2009 and 2010 reduced due to City-wide Level 2 mandatory outdoor water use restrictions.

**Reference:** City of Paso Robles 2010 Urban Water Management Plan<sup>5</sup>

In 1959, the San Luis Obispo County Flood Control and Water Conservation District (District) signed an agreement with Monterey County Water Resources Agency that entitled the District to 17,500 AFY of the annual yield of Lake Nacimiento for uses in San Luis Obispo County. In 2004, the District entered into Nacimiento Project Water Delivery Entitlement Contracts with the City of Paso Robles, San Luis Obispo County, Templeton CSD, Atascadero Mutual Water Company, and the City of San Luis Obispo, to construct the Nacimiento Water Project to deliver untreated lake water<sup>7</sup>. These communities have committed to take delivery of 9,655 AFY, with the City of Paso Robles committing to 4,000 AFY at this time. Commitment of the remaining supply is being considered by these and other water agencies, including the City of Paso Robles. The Nacimiento Water Project began delivering water in 2011.

The City of Paso Robles Lake Nacimiento Water Treatment Plant project includes the construction of a potable water treatment plant necessary to begin taking its water allocation. With delivery of Nacimiento water, the City of Paso Robles can significantly reduce pumping from the Paso Robles Groundwater Basin. Looking ahead, the City of Paso Robles projects increased deliveries (using groundwater) to meet increasing demand, to about 3,400 AFY (see table below). This volume is less than was pumped by the City of Paso Robles in 2008 prior to mandatory landscape watering restrictions being implemented. However, the City of Paso Robles continues to consider alternative supplies including additional supply from Lake Nacimiento and recycled water.

<sup>7</sup> County of San Luis Obispo. "Resolution Number 2004-280." 2004



**Table 2-4. City of Paso Robles Projected Groundwater Use (see footnote 1)**

<b>Groundwater - Volume Projected to be Produced (AFY)</b>					
<b>Basin</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
<b>Paso Robles Basin</b>	100	990	3,400	3,400	3,400
<b>Salinas River Underflow</b>	4,450	4,600	4,600	4,600	4,600
<b>Total Pumping</b>	<b>4,550</b>	<b>5,590</b>	<b>8,000</b>	<b>8,000</b>	<b>8,000</b>

The City of Paso Robles’s reduced groundwater pumping would benefit all groundwater users in the overdrafted Paso Robles Groundwater Basin. The Lake Nacimiento Water Treatment Plant project will add much needed supplemental water supplies for the City of Paso Robles and the basin as a whole, resulting in reduced pumping and dependency on the groundwater basin. In addition, this project will alleviate the summertime water shortages the City of Paso Robles has experienced since 2009 resulting from reduced well capacity related to regional water level declines.

Several disadvantaged communities are now solely dependent on the Paso Robles Groundwater Basin for water supplies, including San Miguel and portions of Shandon. The project will reduce overall demand for groundwater and improve water supply reliability for all water users in the basin, including these communities. In addition, the median household income for Census tract 101 (Paso Robles Westside) is \$31,197, which is significantly below the threshold for a disadvantaged community<sup>4</sup>.

## **1.0 Project Development and Selection**

A comprehensive water supply alternatives evaluation was done as part of the EIR for the Nacimiento Water Project (December 2003)<sup>8</sup>. Several project alternatives were considered, including:

- State Water Project through the Coastal Branch
- Desalination of Seawater
- Reclamation of Wastewater
- Enlargement of Salinas Dam
- Enlargement of Lopez Dam
- Enlargement of Nacimiento Dam
- Possible construction of new reservoirs
- Weather Modification
- Various Nacimiento water treatment plant sizes and configurations

The Nacimiento Water Project was selected because of its high rankings with regard to anticipated quantity of water yield, water supply reliability, estimated cost, and ease of environmental and regulatory permitting. Additional information on the alternatives evaluation can be found in the Nacimiento Project EIR.

<sup>8</sup> Marine Research Specialists. “Nacimiento Water Project, Environmental Impact Report.” 2003.



The City of Paso Robles's Urban Water Management Plan<sup>5</sup> states the city's policy that all water demand resulting from new development is to be served with non-groundwater sources including Lake Nacimiento and recycled water. The 2004 Nacimiento Project Water Delivery Entitlement Contract<sup>7</sup> committed the City to 4,000 AFY of the available Lake Nacimiento supply. The Lake Nacimiento Water Treatment Plant includes the necessary infrastructure to treat and take delivery of that supply.

Paso Robles's City Council approved the water rate increases necessary to fund the construction and operation of the water treatment plant project. The Prop 218 process was completed in 2011 and water rates are in place.

## 1.1 Project Description

The Lake Nacimiento Water Treatment Plant will have a capacity of 2.4 million gallons per day (mgd) and will provide potable water for the City of Paso Robles, enabling the City of Paso Robles to reduce groundwater pumping within the Paso Robles Groundwater Basin. The plant will be built on a 21-acre site the City of Paso Robles has owned for many years (see **Figure 2-2**). The plant site has been operated as a wellfield since 1975 and has four Salinas River underflow wells in place. The Paso Robles Nacimiento Water Project water delivery turnout is also located on the plant site. No land acquisition is needed to complete the project.

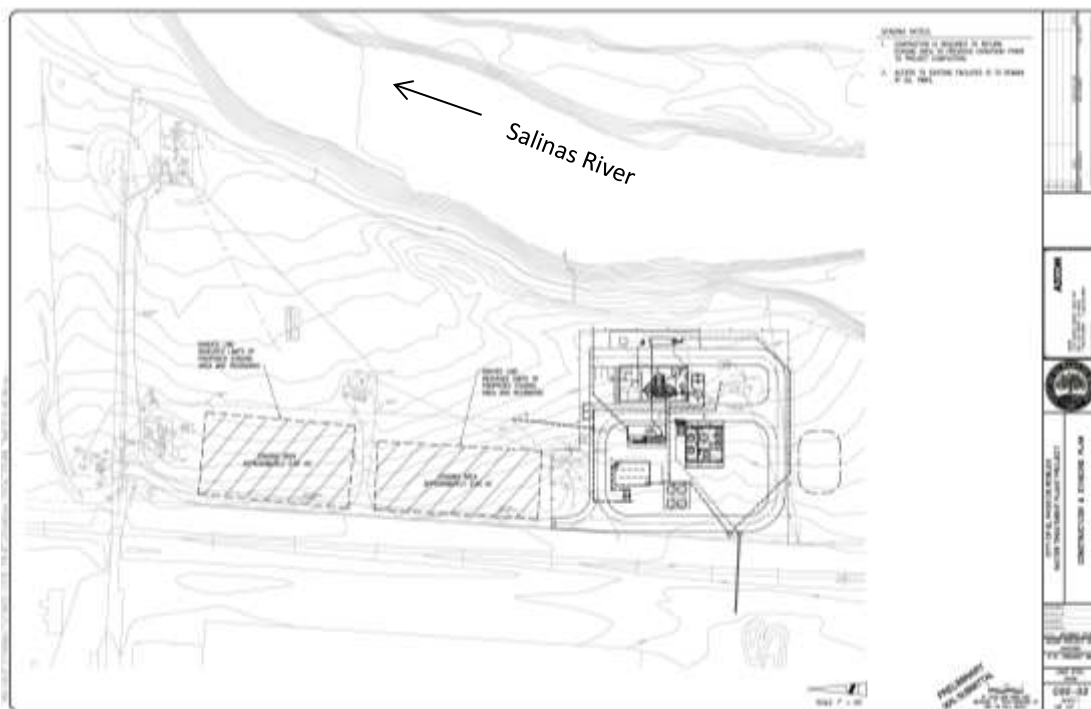


Figure 2-2. *Plan View of City of Paso Robles Lake Nacimiento Water Treatment Plant Site*

The treatment technologies and methods to be employed include: 1) dissolved air floatation pretreatment for Total Organic Carbon (TOC) removal, 2) microfiltration membrane filtration, 3) granular activated carbon for post filtration treatment for Disinfection Byproduct (DBP) control. The major facilities to be constructed as part of the project include:

- Raw water coagulant facility
- Dissolved air flotation (DAF) facilities
- DAF residuals buffering tank/basin
- Membrane filtration building and facilities
- Membrane concentrate neutralization system
- Granular activated carbon filtration facilities
- Treated water (clearwell) storage tank
- High service finished water booster pumping station

Additional information on project design and individual plant components is available in the following design document: City of Paso Robles 2.0 MGD Nacimiento WTP Feasibility Study<sup>9</sup>. Note: The stated capacity of the plant was increased to 2.4 MGD from 2.0 MGD due to a better understanding of the technical capacity of the membrane modules to be used. All aspects of the plant design described in this document remain in effect. The project design is in progress<sup>10</sup> and scheduled to be completed by August 2013. The next step would be to develop construction bidding documents.

The Nacimiento Water Project entitlement agreement is in place. A water line crossing agreement (easement) with the Union Pacific Railroad will be acquired prior to construction for a treated water main that will be constructed as part of the project.

## 1.0 Project Physical Benefits

The Lake Nacimiento Water Treatment Plant project delivers the following physical benefits:

- **Water Supply Benefits:** Develops 2.4 MGD of new water supply for the City of Paso Robles.
- **Water Reliability Benefits:** Off-sets groundwater pumping, thereby reducing City groundwater extractions from the Paso Robles Groundwater Basin and protecting potable groundwater supplies from deeper high TDS groundwater intrusion. Eliminates the threat of seasonal water shortages for Paso Robles residents and adds to the security of supply for the city.
- **Water Quality Benefits:** Delivers better quality, lower TDS water to the City of Paso Robles.

The Lake Nacimiento Water Treatment Plant project will add much needed supplemental water supplies for the City of Paso Robles and the basin as a whole, resulting in reduced pumping and dependence on the groundwater basin. In addition, this project will alleviate the summertime

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<sup>9</sup> AECOM. "City of Paso Robles 2.0-MGD Nacimiento WTP Feasibility Study." 2011.

<sup>10</sup> AECOM. "City of El Paso de Robles Plans for Construction of 2.4 MGD Water Treatment Plant Project". 2012.

water shortages the City of Paso Robles has experienced since 2009 as a result of reduced well capacity related to regional groundwater level declines.

The project's primary physical benefit is the additional 2.4 million gallons per day of potable water supply. The treatment plant will be operated as a peaking facility during the peak summer demand period (June through September), enabling the City of Paso Robles to reduce its use of basin groundwater during this period. Actual plant utilization may vary from year to year, depending on annual and summertime water demand, and the production capacity of the City of Paso Robles's wells.

The project will also provide water supply reliability benefits that cannot easily be quantified. However, by ceasing to rely on the overdrafted Paso Robles Groundwater Basin, expected reliability benefits include:

- Water supply reliability during drought
- Water supply reliability if wells are intentionally or unintentionally contaminated
- Water supply reliability to account for climate changes
- Water quality reliability if groundwater quality changes
- Reduced risk of competing water rights

Finally, use of Lake Nacimiento water will confer water quality benefits to the City and its water customers. The Total Dissolved Solids (TDS) concentration of Nacimiento water is higher quality than the local groundwater supply. The TDS of Lake Nacimiento water ranges from 150 to 300 ppm compared to the average Paso Robles Groundwater Basin TDS concentration of 567 ppm<sup>3</sup>. In addition, the average hardness of Lake Nacimiento water is 140 ppm compared with 377 ppm hardness of the local groundwater supply. Use of the higher quality lake water will encourage the elimination of household water softeners, which introduce additional salts into the City's wastewater stream. Reduction in the use of water softeners and associated salt will improve the quality of wastewater discharges to the Salinas River from the City of Paso Robles's wastewater treatment plant. This is a significant secondary benefit because TDS concentrations in wastewater discharges have, at times, exceeded NPDES discharge permit limits of 1,115 ppm. Use of Lake Nacimiento water in-lieu of groundwater will yield long-term water quality benefits to the Paso Robles Groundwater Basin.

Future water demand within Paso Robles is difficult to predict with certainty at this time due to the very significant water rate increases programmed for the 2012-2016 period. Approved water rates are programmed to increase as follows:

- 2012 - \$2.50/unit
- 2013 - \$3.20/unit
- 2014 - \$3.70/unit
- 2015 - \$4.10/unit
- 2016 - \$4.40/unit.

If the significant water rate increases lead to significant reductions in water demand, then the degree of benefit of the new supply may be reduced, leading to some uncertainty in the benefits calculation.

The water supply and water quality benefits will be measured through the existing City of Paso Robles’s monthly and annual water production monitoring and reporting program. The City of Paso Robles provides monthly and annual water production and customer delivery data each year to San Luis Obispo County and to DWR. These reports can be used to verify project performance. The primary water quality and water supply benefits for with and without project conditions are presented in **Table 2-5** and **Table 2-6** below.

**Table 2-5. Forecasted Annual City of Paso Robles Project Physical Benefits – Water Quality as TDS**

City of Paso Robles Lake Nacimiento Water Treatment Plant			
<b>Benefit Claimed:</b> Water Quality (lower TDS in delivered water; averages shown)			
<b>Measure of Benefit:</b> ppm			
Year	Physical Benefits		
	Without Project	With Project	Change Resulting from Project
2015	567	225	342
Each Year through 2065 (Life of Project)	567	225	342
Comments: Based on 50-year Project Life			

**Table 2-6. Forecasted Annual City of Paso Robles Project Physical Benefits – Annual Average Water Supply**

City of Paso Robles Lake Nacimiento Water Treatment Plant			
<b>Benefit Claimed:</b> Annual Water Supply			
<b>Measure of Benefit:</b> AFY			
<b>Additional Information:</b> Maximum Annual Amount Shown			
Year	Physical Benefits		
	Without Project	With Project	Change Resulting from Project
2013	0	899	899
2014	0	899	899
2015	0	899	899
2016	0	899	899
2017	0	899	899
2018	0	899	899
2019	0	899	899
2020	0	1,127	1,127
2021	0	1,127	1,127
2022	0	1,127	1,127
2023	0	1,355	1,355
2024	0	2,400	2,400
2025	0	899	899
Last Year	0	899	899
Comments: Based on 50-year Project Life			

## **1.0 Measurement of Benefits**

Measurement and initial quantification of the physical benefits is provided in Attachment 7 – Technical Justification. In summary, Water Supply benefits will be measured using standard flow measuring devices with real-time telemetry. Water Quality Benefits will be measured through lab results of water system sampling as required under Title 22 Drinking Water Standards. Water Reliability Benefits will be monitored through groundwater elevations at nearby dedicated monitoring wells, with any long-term average increase in groundwater elevations being associated with increased drought year storage.

### **1.1 Without Project Conditions**

Without the Lake Nacimiento Water Treatment Plant project, the City of Paso Robles would continue to rely solely on the stressed Paso Robles Groundwater Basin for its water supply, placing additional demands and stress on the groundwater basin. Seasonal water supply shortages would continue due to declining well production capacity resulting from continued groundwater level decline.

### **1.2 Potential Adverse Physical Effects**

There are no potential adverse effects associated with the project. The additional 2.4 MGD of water supply capacity will be used to make up for lost well production capacity and will be used to meet the peak summer demands of existing customers.

### **1.3 Project Contacts**

The City of Paso Robles  
Keith Larson, Water Conservation Manager  
1000 Spring St., Paso Robles, CA 93446  
(805) 237-3861

## Project 2. Attiyeh Ranch Conservation Easement

Attiyeh Ranch is an 8,305 acre property located in the Adelaida region of northern San Luis Obispo County and extends into southern Monterey County, as shown in **Figure 2-3**.

Attiyeh Ranch contains outstanding habitat for black bear, mountain lion, bobcat, mule deer, golden and bald eagles, prairie falcon, and numerous other species. Streams on the ranch are thought to contain isolated populations of steelhead trout. Oak woodland habitat and the diversity of woodlands on the property is notable, with approximately 2,900 acres of coast live oak woodlands and mixed hardwoods; 1,300 acres of coast live oak with blue oak woodlands; and 430 acres of valley oak woodland and savannah exhibited on the Attiyeh Ranch in San Luis Obispo County alone<sup>3</sup>.

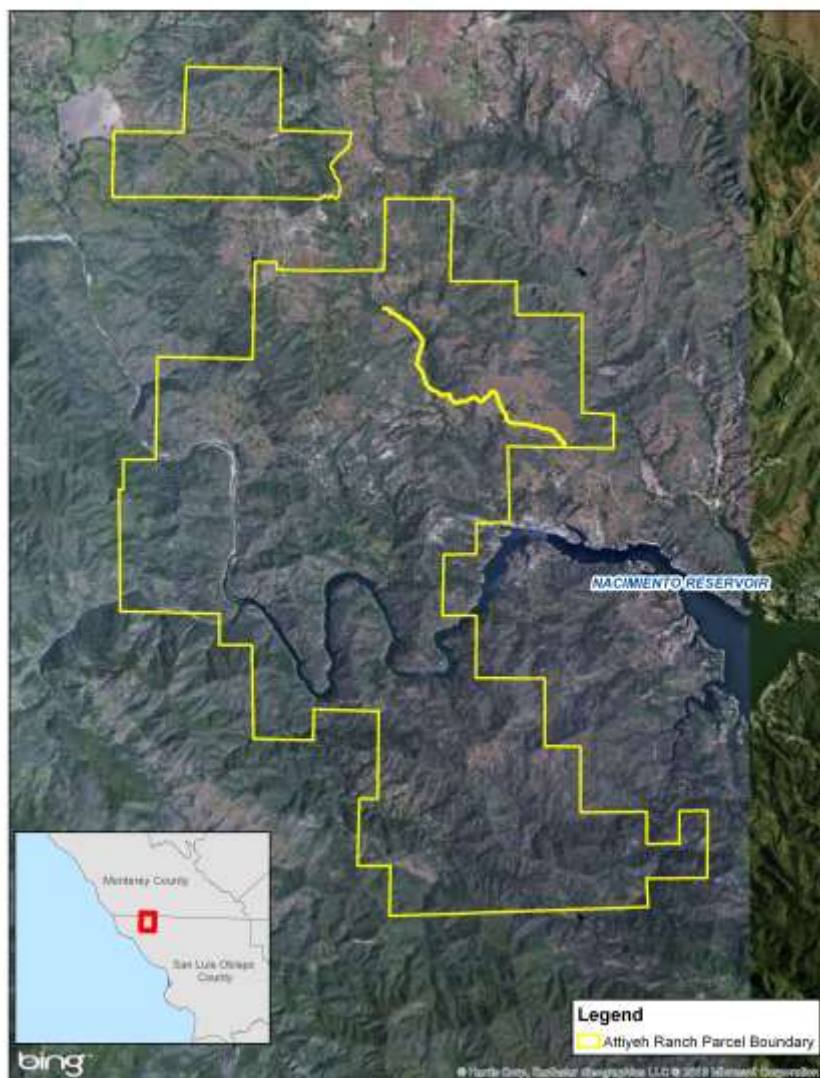


Figure 2-3. *Attiyeh Ranch Property Boundary*

These healthy natural habitats provide critical migration corridors between the Ventana Wilderness to the north, and the Los Padres National Forest to the south. Bridging this gap would address one of only a few areas needed to maintain an open migration corridor from Monterey to Mexico<sup>11</sup>.

In addition to the great abundance of upland habitats found on the ranch, the Attiyeh Ranch contains numerous aquatic resources as well. In total, there are approximately six (6) miles of the Nacimiento River upstream of Lake Nacimiento, as well as numerous tributaries including two miles of Asbury Creek, one mile of Little Burnett Creek, and half mile of Gould and Gulch House Creeks located on the ranch. The "tail of the dragon" of Lake Nacimiento is located on the Attiyeh Ranch and includes Grizzly Bend and "The Narrows" - areas of the lake which are tremendously scenic and popular for recreational use.

The Attiyeh Ranch Conservation Easement will permanently retire development rights on the ranch, protecting the property from subdivision and land use intensification. As a result, valuable wildlife habitat and migration corridors will be conserved, open space will be preserved enhancing recreational use, and the water resources will be protected.

## 2.0 Project Need

The Attiyeh Ranch is a highly desirable property located in the rural Adelaida area that has a significant amount of land on the Nacimiento Reservoir waterfront extending north to Monterey County. The ranch is in threat of future development due to the increase in development of hobby ranches and vineyards that has occurred in the region in the last decade. California's Central Coast is quickly growing as one of the premier areas in the world for vineyards. In San Luis Obispo County, approximately 28,500 acres of new vineyards were established between 1996 and 2004<sup>12</sup>. The Paso Robles American Viticultural Area (AVA) is the state's fastest growing wine region with over 200 wineries in 614,000 acres. Although the Attiyeh Ranch sits just west of the Paso Robles AVA boundary, the soils and climate conditions on the ranch are significantly similar to conditions of the Paso Robles AVA and development is likely to extend westward over time.

One way to consider vineyard development potential on the Attiyeh Ranch is to study the soils on the ranch. There are numerous different soils on the ranch, however the Dibble and Shimmon soil series are common. These soils are formed from colluvial and residual material weathered from sandstone and shale. They are moderately deep to deep with highly variable slopes ranging to 75 percent. Dibble soils have a surface layer of clay loam and subsurface is clay underlain by mudstone and shale. Shimmon soils have a surface layer of loam underlain with clay loam and sandstone. These soils, on low to moderate slopes, have severe limitations that reduce the plant choices for crop production; however they are suitable for certain grape varieties, evidenced by planting on the Stephan vineyard which is located nearby and is composed of Dibble soils. Because these soils are indeed suitable for vineyard development, the concern for planting on

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<sup>11</sup> Spencer, W.D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian-Romsos, J. Strittholt, M. Parisi, and A. Pettler. "California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California." 2010.

<sup>12</sup> San Luis Obispo County Department of Agriculture. "2004 Annual Report." 2004.

steep slopes exists. Nearly 45 percent of the Attiyeh Ranch is either Dibble or Shimmon soils of slopes over 30 percent. A conservation easement on the Attiyeh Ranch would protect the ranch from being converted to vineyard operations that exacerbate soil erosion from grape installation on steep slopes.

In addition to the growing popularity of vineyards in the rural Paso Robles and Adelaida area, the region is also a popular recreational area. Nacimiento Reservoir is one of the major recreational attractions on the Central Coast with over 165 miles of shoreline and 5,400 acres of pool surface for boating, swimming, fishing, and general recreation. According to the 2013 amended Nacimiento Area Plan<sup>13</sup>, recreation is the most important activity in the Nacimiento Planning Area, with Lake Nacimiento providing a recreational resource of greater than regional significance (pg. 6-2). Additionally, significant scenic impacts could occur along the lake and upstream should a maximum build-out scenario be realized on the Attiyeh Ranch. The Attiyeh Ranch conservation easement would protect the valuable scenic open space resources on the ranch and allow the public to enjoy the property with docent-led hikes held periodically throughout the year. Future landowners may not be amiable to public access on the ranch and may deny public access on the property. This would limit the amount of access to open space surrounding Nacimiento Reservoir to existing trails. The protection of open space on the ranch not only enhances the recreational resources surrounding Nacimiento Reservoir, but also protects habitat for numerous wildlife species found in the region.

The Attiyeh Ranch has a diversity of natural resources including coast live, blue, and valley oak woodlands, chaparral, valley grassland, riparian, and freshwater wetlands. Vegetation on the Attiyeh Ranch was quantified using San Luis Obispo County Geographic Information Systems (GIS) data, revealing approximately 2,900 acres of coast live oak woodlands and mixed hardwoods, approximately 1,300 acres of coast live oak with blue oak woodlands, and approximately 430 acres of valley oak woodlands exist on the Attiyeh Ranch in San Luis Obispo County alone. The California Department of Fish and Wildlife and the California Native Plant Society's list of vegetation alliances and associations describes valley oak woodlands (*Quercus lobata*) as a G3S3 community (highly impaired and regeneration is not sustainable as a result of habitat conversion and inconsistent land management practices). Conservation of the Attiyeh Ranch would permanently protect over 400 acres of this imperiled habitat. The natural resources on the ranch support a variety of wildlife species as well, including mule deer, bobcat, mountain lions, bear, and golden and bald eagles which have all been observed on the ranch.

Conservation of the Attiyeh Ranch not only ensures future habitat for these species, but also serves as habitat for additional species migrating from other areas due to displacement or following migration corridors through California's open spaces. Attiyeh Ranch lands are part of a wildlife corridor of statewide significance. The California Essential Habitat Connectivity Project<sup>11</sup> has identified essential wildlife migration corridors throughout California, referred to as "linkages". Using these data, two linkages were identified directly adjacent to the Attiyeh Ranch extending north to the Big Sur area of San Geronimo<sup>14</sup> (See **Figure 2-4**). One linkage represents wildlife migration through the Los Padres National Forest along the Big Sur coast to San Geronimo, and the second linkage extends from Weferling Canyon, in Monterey County, south

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<sup>13</sup> San Luis Obispo County. "San Luis Obispo County code – Chapter 22.102 – Nacimiento Planning Area." 2013.

<sup>14</sup> The Land Conservancy of San Luis Obispo County. "Attiyeh Ranch Parcel Map." 2013.



to San Geronimo. Preservation of the ranch would protect natural resources needed by wildlife to support wildlife migration throughout this area and prevent habitat fragmentation.

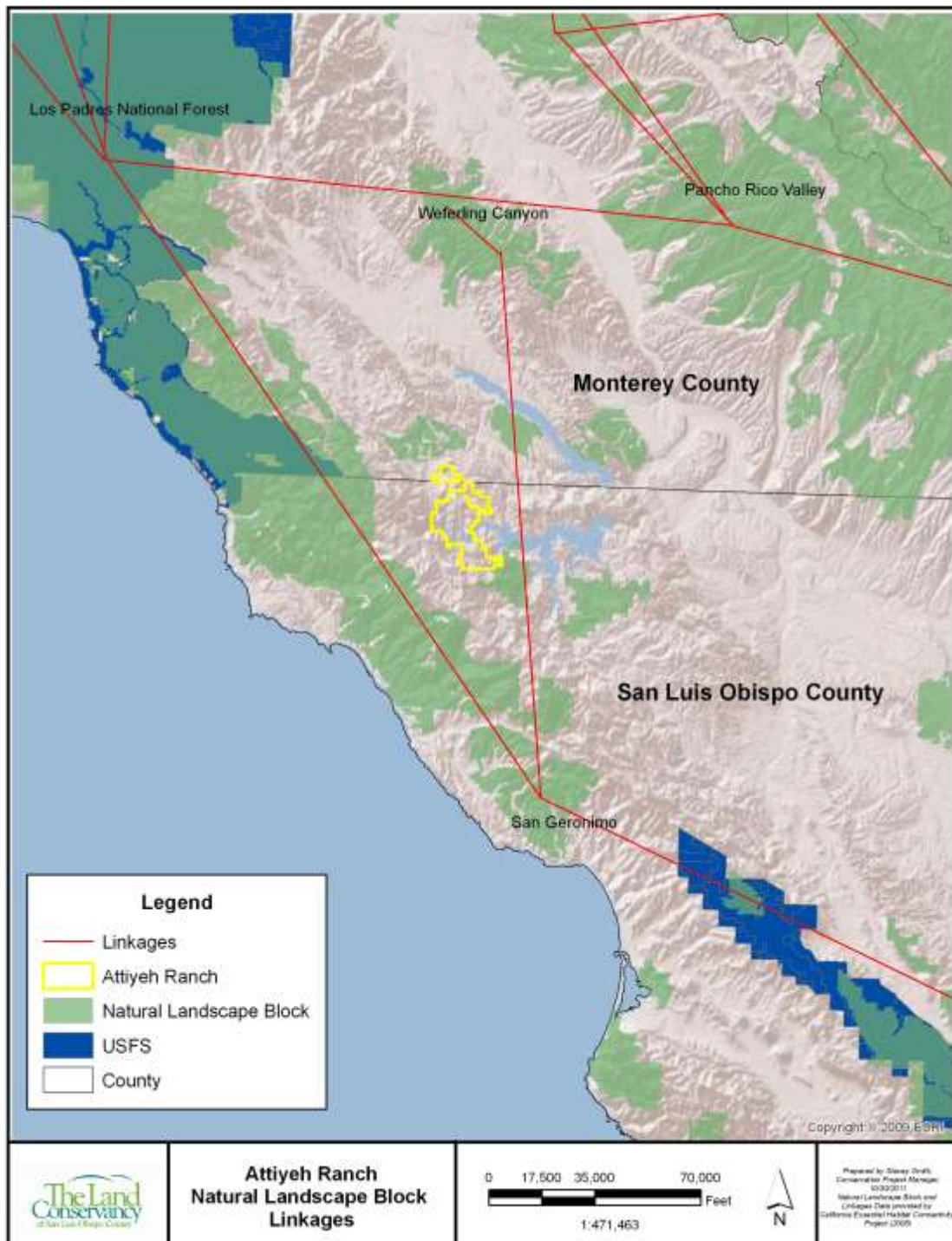


Figure 2-4. *Wildlife Migration Corridor Linkages Surrounding Attiyeh Ranch.*

The Attiyeh Ranch contains significant water resources in addition to its upland resources. Should the Attiyeh Ranch be converted from open space and low-density rangeland to more intensive land uses, the water quality in local streams and the reservoir could be degraded. When an existing land use is converted to a more intensive use, runoff patterns are altered, soil conditions change that affect rates of infiltration, and vegetation types and densities are altered. This process, known as hydromodification, has been shown to result in significant changes in the timing and volume of runoff, which in turn affects the patterns and rates of erosion.

The impacts of hydromodification would affect two key water resource areas: water quality and water supply. One of the most striking and well-studied impacts of hydromodification are the pronounced increases in runoff, and the efficiency with which that runoff reaches stream channels. When the increased runoff reaches the network of stream channels it can have a pronounced effect on channel stability. Although the impacts are site and landscape dependent, hydromodification effects on channel stability can result in gully formation, an increase in bank erosion, headcut initiation and migration, and headward expansion of the channel network. Downstream effects can include aggradation, impacts to aquatic and riparian communities, and degraded water quality.

Using an erosion and sediment delivery model it was determined that if the Attiyeh Ranch was converted to intensive grazing it could lead to 35% increased annual sedimentation rate from current sedimentation rates. Conversion to ranchettes could result in 181% increased annual sedimentation rate and conversion to vineyards could result in 338% increased annual sedimentation rate. Greater sedimentation in local streams and the reservoir impacts water quality and degrades aquatic species' habitat.

Given the physical setting of Attiyeh Ranch, the most likely land uses changes that would be expected to occur if the property remains unprotected include: conversion to a more intensive cattle grazing regime, conversion to vineyard, or parcel-specific development of ranchettes and hobby farms. Based on the well-understood effects associated with hydromodification, these types of land use conversions would results in less soil infiltration, higher peak runoff events in the winter months, and higher erosion rates from the affected watersheds.

Increased runoff and sedimentation from the Attiyeh Ranch would have a direct impact to the Nacimiento Reservoir, located downstream from the ranch. Nacimiento is first and foremost a water supply reservoir. Winter high flows are stored in winter for use in the summer when it is needed for groundwater recharge, direct agricultural use, and municipal supplies. With increased development, water infiltration into the soil decreases creating runoff events associated with precipitation. With greater open space and natural areas, water can infiltrate into the soil during rain events, avoiding water runoff and allowing the water to slowly recharge waterways throughout the year. If additional water is added to the reservoir in the winter when the reservoir is full, that water will spill from the reservoir and be lost for later use. Using a hydrologic model, changes in runoff volume were determined for four different land use scenarios, including the existing land use, intensive grazing, vineyards, and ranchettes. It was determined if the ranch was converted to intensive grazing, then an average 711 acre-feet of water would be

lost from the reservoir annually. Vineyards and ranchettes would have a loss of approximately 200 acre-feet of water annually.

## 2.0 Project Development and Selection

The Attiyeh family approached The Land Conservancy to propose conservation of the 8,305 acre ranch using a conservation easement to forever retire any development and subdivision rights and preserve the set of parcels as one ranch, in perpetuity. The project was proposed to The Land Conservancy's Land Committee which is composed of legal advisors, scientists, and land use planners. This committee reviews the project's goals and costs to ensure it is consistent with the priorities established in relevant watershed plans and in both the public's and the organization's best interest to pursue.

Attiyeh Ranch is located in the Nacimiento River Watershed and addressed in the San Antonio and Nacimiento Rivers Watershed Management Plan<sup>15</sup>. In the watershed plan, the Nacitone Watersheds Steering Committee identified several core issues as they relate to the San Antonio and Nacimiento River watersheds, one being "Watershed Health: Plants & Animals", wherein "Objective 2: Establish outreach and education programs to protect watershed health" was identified, and "Implementation 2B: Develop and provide, to interested landowners, balanced information about the Williamson act, *conservation easements* and projects proposed by *land trusts*. This information would highlight the legal commitment on the part of the landowner; types of conservation easements, and options for negotiating allowable activities on any contemplated *conservation easement* was proposed as a way to meet this objective (pg. 122).

Consistent with the San Antonio and Nacimiento Rivers Watershed Management Plan goals, the Land Committee recommended the project to The Land Conservancy's Board of Trustees wherein it was considered again and ultimately adopted in May, 2009. Senior Wildlife Biologist with the California Department of Fish and Wildlife, Bob Stafford, provided additional support for the potential to conserve this region using conservation easements. Mr. Stafford confirmed that this area is an integral segment to existing wildlife corridors and that protection of this area is highly desirable (Pers. Comm.).

An alternative to the conservation easement would be a fee simple acquisition. However, with a total land value of over \$16 million dollars, fee simple acquisition is cost prohibitive. A conservation easement valued at approximately \$8.4 million is the only reasonable alternative to conserve the property as open space under private ownership.

## 2.1 Project Description

The project involves the acquisition of a conservation easement to protect the land in perpetuity.

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<sup>15</sup> Nacitone Watersheds Steering Committee and Central Coast Salmon Enhancement, Inc. "San Antonio and Nacimiento Rivers Watershed Management Plan." 2008.

The draft Attiyeh Ranch Conservation Easement was reviewed by the landowner with no substantive changes. The final easement language is currently being developed and contains the following prohibited land uses to ensure the land is managed consistent with the project goals:

- Subdivision
- Construction of houses or other structures
- Waste dumps
- Grading and soil dumping
- Surface and/or subsurface mineral development
- Installation of new above-ground utility systems, including, without limitation, water, sewer, power, fuel, and communication lines and related activities and equipment, except for systems servicing permitted agricultural uses on the ranch and existing structures
- Cutting or removal of native trees, shrubs, or other vegetation, except for continued reasonable land management purposes, and as may be necessary for elimination of diseased growth, fire protection, and similar protective measures, and to protect human safety

Just prior to the recordation of the easement, an updated Preliminary Title Report and Appraisal will be completed to ensure the title is clear of any potentially conflicting encumbrances and that the appraisal value is accurate. Additionally, The Land Conservancy collect baseline documentation information which describes the condition of the ranch at the time the easement is recorded. These data, along with baseline photographs, will be compiled in a report signed by both The Land Conservancy and the landowner before closing. All matching funds must be confirmed and funds sent to the project's escrow account. Once all funds have reached escrow, the conservation easement will be signed, notarized, and recorded.

To ensure all easement conditions are met and the project benefits are delivered, The Land Conservancy has adopted a Conservation Easement Monitoring Policy and Procedure (Exhibit B) that clearly establishes the methods to monitor all conservation easement properties it holds. Any changes to the policy must be reviewed and approved by The Land Conservancy's Board of Trustees. The conservation easement monitoring procedure can be amended by The Land Conservancy staff, as needed. At a minimum, all conservation easements are monitored once a year by two staff members of The Land Conservancy. Any actual or threatened violations to a conservation easement are documented and the landowner is notified immediately to resolve issues as soon as possible. The Land Conservancy maintains a conservation easement stewardship and defense fund as well as conservation easement insurance to help safe guard against violations and defend the terms of the easement in the event of an enforcement action.

## 2.2 Project Physical Benefits

The Attiyeh Ranch Conservation Easement Project delivers the following physical benefits:

- **Environmental Stewardship Benefits:** Protects 8,305 acres of open space which supports local wildlife populations and wildlife corridors. Preserves the current land practices and protects from increased soil erosion that would lead to degraded habitat conditions on the mainstem of the Nacimiento River and its key tributaries.
- **Community/Social Benefits:** Allows public access on the ranch with docent-led hikes which increases the amount of open space accessible to the public in the Nacimiento Reservoir area and preserves scenic enjoyment for visitors.

- **Water Supply Benefits:** Protects the current water supply by maintaining the existing water supply at its current capacity and avoids water supply purchase costs that would otherwise be incurred if future land use modifications resulted in changes to the magnitude and timing of inflow to Nacimiento Reservoir.

### **2.2.1 Environmental Stewardship Benefits**

The Attiyeh Ranch Conservation Easement would protect 8,305 acres of open space which supports local wildlife populations, including mule deer, bobcat, mountain lions, and bear which have all been observed on the ranch. The conservation of the Attiyeh Ranch will protect numerous natural ecosystems that exist on the ranch including coast live, blue, and valley oak woodlands, chaparral, valley grassland, riparian, and freshwater wetlands. Vegetation on the Attiyeh Ranch can be quantified using San Luis Obispo County Geographic Information Systems (GIS) data<sup>16</sup>. There are approximately 2,900 acres of coast live oak woodlands and mixed hardwoods, approximately 1,300 acres of coast live oak with blue oak woodlands, and approximately 430 acres of valley oak woodland on the Attiyeh Ranch in San Luis Obispo County alone (SLO County, 2009). The California Department of Fish and Game and the California Native Plant Society's list of vegetation alliances and associations describes valley oak woodlands (*Quercus lobata*) as a G3S3 community (highly impaired and regeneration is not sustainable as a result of habitat conversion and inconsistent land management practices). Conservation of the Attiyeh Ranch would permanently protect over 400 acres of this imperiled habitat.

Preservation of the Attiyeh Ranch permanently protects regional wildlife corridors throughout the Central Coast. The California Essential Habitat Connectivity Project (2005) has identified essential wildlife migration corridors throughout California, referred to as "linkages". Reviewing GIS data, two linkages were identified directly adjacent to the Attiyeh Ranch extending north to the Big Sur area of San Geronimo<sup>14</sup>. One linkage represents wildlife migration through the Los Padres National Forest along the Big Sur coast to San Geronimo, and the second linkage extends from Weferling Canyon, in Monterey County, south to San Geronimo. Preservation of the ranch would protect natural resources needed by wildlife to support wildlife migration through the Central Coast and prevent habitat fragmentation.

The preservation of the Attiyeh Ranch as open space prevents higher intensity land uses that would exacerbate soil erosion and degrade aquatic habitat. In the San Antonio and Nacimiento Rivers Watershed Management Plan<sup>15</sup>, a comparison of landscape-scale rates of erosion, based on data from sediment monitoring stations, shows a clear distinction in the rates and patterns of erosion and sediment delivery for the Nacimiento watershed and the San Antonio watershed. The most significant sources of sediment within the Nacimiento watershed were determined to be reactivation of previously deposited alluvial materials and fire-dependent influxes of sediment from the upper watershed. Conversely, the San Antonio watershed, which abuts the Nacimiento watershed to the east, has a higher proportion of total sediment delivery derived from higher intensity land uses such as agriculture, grazing, and residential development.

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<sup>16</sup> The Land Conservancy of San Luis Obispo County. "Attiyeh Ranch Natural Ecosystems San Luis Obispo County." 2006.

With an understanding of this framework, an erosion and sediment delivery model was prepared for the Nacimiento watershed to evaluate how changes in land use on the Attiyeh Ranch would change rates of erosion and sediment delivery to the mainstem of the Nacimiento River and its tributaries. Four land use scenarios were modeled. The scenarios included existing conditions and three potential land uses: a) intensive cattle grazing, b) vineyard development, and c) ranchette development.

The erosion modeling is based on work that was conducted in the Morro Bay watershed over the past few decades in support of a TMDL. The data developed for the Morro Bay watershed provides the most comprehensive, regional source of information on erosion rates from different land use types. In the Morro Bay study, researchers determined that approximately 90% of the sediment entering the channel was either from sheet and rill erosion or from eroding banks. Consequently, our model focuses on those two sources of erosion to understand changes in sediment delivery under different land use scenarios.

Within a GIS framework, cover types were assigned to the Attiyeh Ranch for the four land use scenarios and the published erosion rates were used to calculate sediment delivery in tons per acre per year (tons/acre/year) (**Table 2-7**). Cover types include rangeland, woodland and cropland. GIS was also used to derive a stream network for the Ranch and assigned stream orders to each stream segment. Total length of stream for each stream order was then calculated for the Attiyeh Ranch and stream bank erosion was calculated using published erosion rates in tons per bank mile per year (ton/mile/year). The stream bank erosion potential and rates assigned to the land uses modeled are included in **Table 2-8**. Results from the erosion model are presented in **Table 2-9** for each of the land use scenarios along with the percent increase in sediment generated from the Attiyeh Ranch for each of the potential land use scenario.

**Table 2-7. Erosion rates and acreages based on cover type.**

Cover Type	Erosion Rate (tons/ac/yr)	Potential Land Use Scenario (acres)			
		Existing	Grazing	Vineyard	Ranchette
Rangeland	0.65	2556	2556	0	1917
Woodland	0.81	5664	5664	5664	5664
Cropland	5.12	0	0	2556	639

\*Existing rangeland was mapped in GIS as open grassland and oak savannah areas. All rangeland was assumed to be converted to cropland under the vineyard scenario. The ranchette scenario assumes twenty-five percent of rangeland is converted to vineyard (i.e. cropland)

These data were then used to revise the sediment budget previously developed for the Nacimiento River and estimate the potential increase in sediment delivery to the Nacimiento River under a without project condition.

**Table 2-10** provides a summary of the results.

**Table 2-8. Erosion Potential and Rate by Land Use Scenario**

Stream Order	Channel Length at Ranch (miles)	Potential Land Use Scenario	Erosion Potential	Erosion Rate (tons/bank mile/year)
1	18.75	Existing Conditions	Slight	10
		Intensive Grazing	Moderate	75
		Vineyard Development	Severe	300
		Ranchette Development	Severe	300
2	8.02	Existing Conditions	Slight	10
		Intensive Grazing	Moderate	75
		Vineyard Development	Severe	300
		Ranchette Development	Severe	300
3	4.97	Existing Conditions	Slight	10
		Intensive Grazing	Moderate	125
		Vineyard Development	Severe	500
		Ranchette Development	Moderate	125
4	0.97	Existing Conditions	Slight	15
		Intensive Grazing	Slight	15
		Vineyard Development	Moderate	150
		Ranchette Development	Moderate	150
5	5.56	Existing Conditions	Slight	15
		Intensive Grazing	Slight	15
		Vineyard Development	Moderate	150
		Ranchette Development	Moderate	150

**Table 2-9. Average Annual Erosion Rates Predicted from Erosion Model for Attiyeh Ranch**

Potential Land Use Scenario	Average Annual Erosion Rate (tons/year)	Percent Increase
Existing Conditions	6,665	
Intensive Grazing	8,977	35%
Vineyard Development	29,174	338%
Ranchette Development	18,739	181%

**Table 2-10. Additional Sediment Load Generated from Attiyeh Ranch by Land Use Scenario**

Potential Land Use Scenario	Annual Erosion Rate (tons/year)	Additional Sediment Load from Attiyeh Ranch (tons over 36 years)
Existing Conditions	6,893	
Intensive Grazing	9,285	334,254
Vineyard Development	30,174	1,086,278
Ranchette Development	19,382	697,751

### **2.0.1.1 Community/Social Benefits**

Nacimiento Reservoir is one of the major recreational attractions on the Central Coast, with over 165 miles of shoreline and 5,400 acres of pool surface for boating, swimming, fishing, and general recreation. According to the amended 2013 Nacimiento Area Plan<sup>13</sup>, recreation is the most important activity in the Nacimiento planning area, with Lake Nacimiento providing a recreational resource of greater than regional significance (pg. 6-2).

The Attiyeh Ranch has spectacular scenic open space, excellent for low-impact use such as hiking and scenic enjoyment. The Attiyeh Ranch Conservation Easement will allow the public to hike on docent-led hikes, two to three times a year. This would increase the amount of open space accessible to the public in the Nacimiento Reservoir area by 8,305 acres and preserve scenic enjoyment of the region for visitors.

### **2.0.1.2 Water Supply Benefits**

To understand the water supply benefits associated with protecting the Attiyeh Ranch property under its current level of land use and limited future land use changes, a hydrologic model was developed for the project area. The hydrologic model was used to evaluate changes in runoff volume under the following four land use scenarios: Existing conditions, intensive grazing, vineyards, and ranchette/hobby farm.

The hydrologic modeling was conducted using The U.S Army Corps of Engineers, Hydrologic Engineering Center Hydrologic Modeling System (HEC-HMS) to model the different land use scenarios. The HEC-HMS software is designed to simulate the precipitation/runoff processes of dendritic watershed systems. The model components include a basin model to represent the physical watershed, a meteorological model to represent how precipitation is generated, and a control specification to define the length of a simulation run. Model outputs include runoff hydrographs that are converted to a volume of runoff for a modeled storm event.

The four land use scenarios were modeled at six sub-watersheds within the Attiyeh Ranch. Each land use scenario was run under varying rainfall intensities and runoff volumes were computed. Percent increases in runoff volume from the Attiyeh Ranch were calculated for each potential land use scenario compared to existing conditions. The percent increases estimated for the Attiyeh Ranch were then correlated to precipitation depths from an historic rainfall record and propagated through a water balance developed for Lake Nacimiento. The water balance was used to estimate the volume of additional reservoir spill if a potential land use scenario had been implemented at the Attiyeh Ranch under the historic hydrologic regime.

The primary variables that are used to model runoff processes within the HEC-HMS model are the Composite Runoff Curve Number (CN) and the hydrologic properties of soil. A Geographic Information System is used to composite the values or properties of these variables spatially based on published CN's associated with land cover types and hydrologic soil groups available as part of the NRCS Soil Survey. Summaries of the composite CN's, hydrologic condition of the soil, land cover type, and percent impervious area are included in **Table 2-11**.



**Table 2-11. Input variables to the HEC-HMS hydrologic model**

Potential Land Use Scenario	Cover Type	Hydrologic Condition	Curve Number (CN) for Hydrologic Soil Group				Percent Impervious Area
			A	B	C	D	
Existing Conditions	Woods-grass combination	Good	32	58	72	79	0
Intensive Cattle Grazing	Woods-grass combination	Poor	57	73	82	86	0
Vineyards	Row Crop (Contoured)	Poor	70	79	84	88	0
Ranchettes	Woods-grass combination	Fair	43	65	76	82	5

Hydrologic models were developed for six sub-watersheds within the Attiyeh Ranch that encompassed as much of the ranch acreage as possible and were representative of the vegetation and terrain within the ranch (**Figure 2-5**). The area of the six sub-watersheds modeled comprises approximately sixty-nine percent of the total Attiyeh Ranch area. Model runs were computed for each sub-watershed under the four land use scenarios using twenty-four hour recurrence interval precipitation depths for a range of storm frequencies from 4-month to 25-year. Runoff volumes were calculated and the percent increase in runoff volume was determined between the potential land use scenarios and existing conditions. The percent increase in runoff for the entire Attiyeh Ranch was then estimated for each land use scenario and recurrence interval by proportioning the results for the six sub-watershed to the acreage total for the Ranch. **Table 2-12** presents the results for the range of storm events assessed.

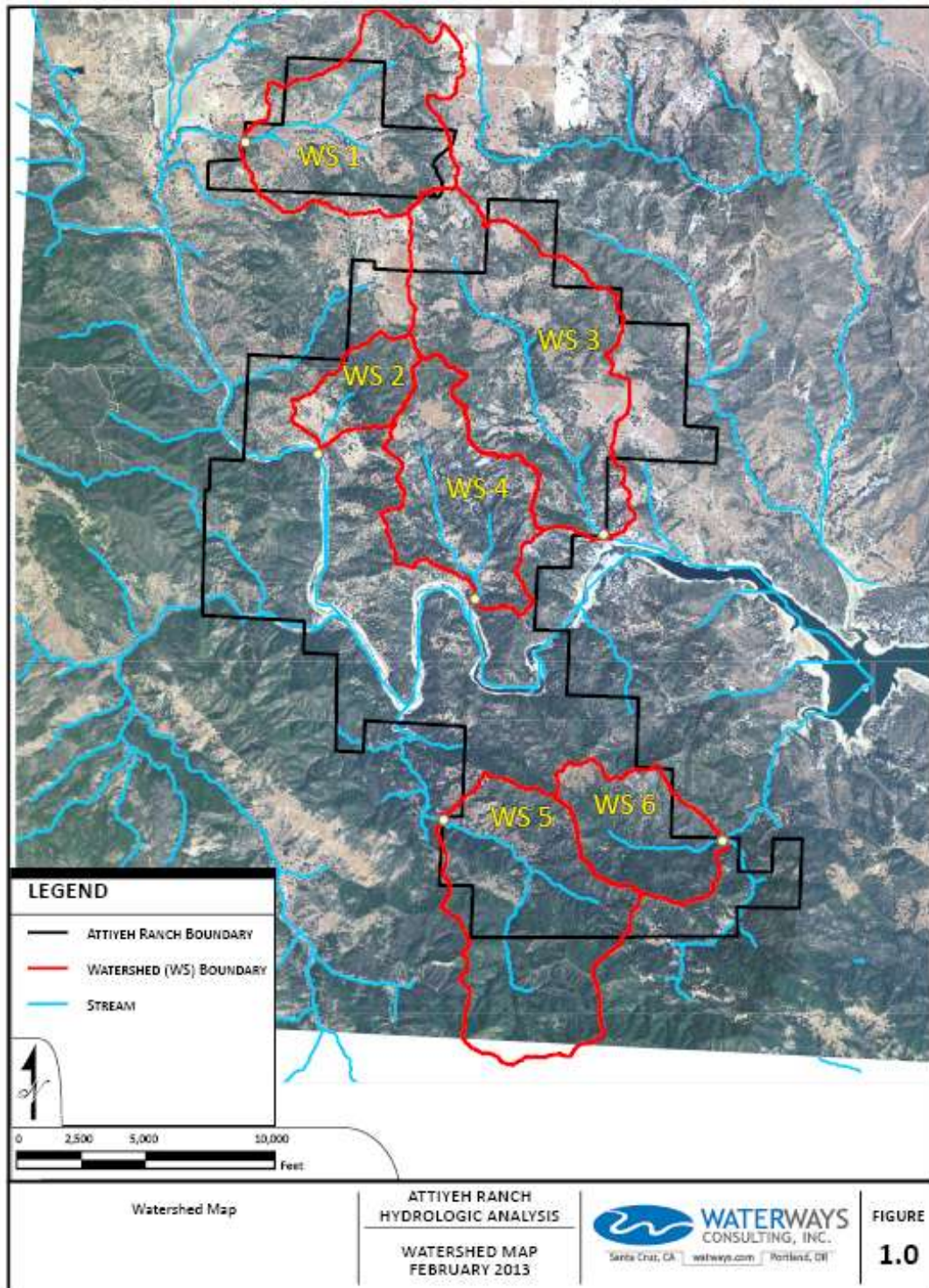


Figure 2-5. *Attiyeh Ranch Watershed Map*

**Table 2-12. Percent Increase in Runoff Volume from Attiyeh Ranch by Potential Land Use**

24-Hr Recurrence Interval Storm	Percent Increase in Runoff Volume from Attiyeh Ranch (Potential Land Use Scenario vs. Existing Conditions)		
	Intensive Grazing	Vineyard Development	Ranchette Development
4-month to 1-year	232%	117%	128%
1-year to 2-year	69%	37%	31%
2-year to 5-year	50%	27%	21%
5-year to 10-year	37%	21%	16%
10-year to 25-year	31%	17%	13%
≥ 25-year	25%	14%	10%

A historic water balance, prepared previously for Nacimiento Reservoir, was used to propagate the percent change in runoff from the Attiyeh Ranch under the potential land use scenarios (**Table 2-13**) to assess if changes in land use results in additional spill from the reservoir. The water balance was constructed using data from 1958 through 2006. A cumulative total of the additional runoff from Attiyeh Ranch was calculated and added to the reservoir volume on a daily basis. The reservoir elevation was then back calculated. When the reservoir water surface became higher than the spillway at elevation 800.0 feet, the additional runoff from the Ranch was recorded as “additional spill”. **Table 2-13** summarizes the water years and volume of additional spill from Lake Nacimiento under the three potential land use scenarios.

**Table 2-13. Additional Spill from Lake Nacimiento Under Potential Land Use Scenarios at Attiyeh Ranch**

Water Year	Potential Land Use Scenarios					
	Intensive Grazing		Vineyard Development		Ranchette Development	
	Additional Reservoir Spill (acre-ft.)	% of lake volume	Additional Reservoir Spill (acre-ft.)	% of lake volume	Additional Reservoir Spill (acre-ft.)	% of lake volume
1967	1,672	0.44%	360	0.10%	379	0.10%
1969	11,590	3.07%	3,719	0.98%	3,908	1.03%
1978	1,286	0.34%	472	0.12%	668	0.18%
1983	12,033	3.18%	2,237	0.59%	2,351	0.62%
1998	8,157	2.16%	2,998	0.79%	3,150	0.83%
2005	115	0.03%	0	0.00%	0	0.00%
<b>Total</b>	<b>34,853</b>	<b>9.22%</b>	<b>9,786</b>	<b>2.59%</b>	<b>10,455</b>	<b>2.77%</b>
<b>Average Annual Additional Spill</b>	<b>711 ac-ft/yr</b>		<b>200 ac-ft/yr</b>		<b>213 ac-ft/yr</b>	

## 2.0 Annual Physical Benefits

The measure of physical benefit for both environmental and community benefits are the same and measured in acres. The environmental benefits are measured in acres of open space and wildlife corridor protected. The community benefits are measured in acres of open space protected for the public access and enjoyment. The annual physical benefits are 8,305 acres of open space as shown in **Table 2-14** below.

**Table 2-14. Forecasted Annual Attiyeh Ranch Project Physical Benefits – Community/Social**

Attiyeh Ranch Conservation Easement Project							
<b>Benefit Claimed:</b> Environmental/Community							
<b>Measure of Benefit:</b> acres							
<b>Additional Information:</b> Acres open space protected for habitat and accessible to the public for hiking.							
Year	Physical Benefits			Year	Physical Benefits		
	Without Project	With Project	Change Resulting from Project		Without Project	With Project	Change Resulting from Project
2013	0	8,305	8,305	2047	0	8,305	8,305
2014	0	8,305	8,305	2048	0	8,305	8,305
2015	0	8,305	8,305	2049	0	8,305	8,305
2016	0	8,305	8,305	2050	0	8,305	8,305
2017	0	8,305	8,305	2051	0	8,305	8,305
2018	0	8,305	8,305	2052	0	8,305	8,305
2019	0	8,305	8,305	2053	0	8,305	8,305
2020	0	8,305	8,305	2054	0	8,305	8,305
2021	0	8,305	8,305	2055	0	8,305	8,305
2022	0	8,305	8,305	2056	0	8,305	8,305
2023	0	8,305	8,305	2057	0	8,305	8,305
2024	0	8,305	8,305	2058	0	8,305	8,305
2025	0	8,305	8,305	2059	0	8,305	8,305
2026	0	8,305	8,305	2060	0	8,305	8,305
2027	0	8,305	8,305	2061	0	8,305	8,305
2028	0	8,305	8,305	2062	0	8,305	8,305
2029	0	8,305	8,305	2063	0	8,305	8,305
2030	0	8,305	8,305	Comments: Without the conservation easement, the property would remain inaccessible for public recreation.			
2031	0	8,305	8,305				
2032	0	8,305	8,305	Without the conservation easement, none of the property's natural resources are protected from development or alternative land uses that could impact natural resources. The Attiyeh Ranch conservation easement protects these natural resources, in perpetuity, by retiring development rights on the ranch forever.			
2033	0	8,305	8,305				
2034	0	8,305	8,305				
2035	0	8,305	8,305				
2036	0	8,305	8,305				
2037	0	8,305	8,305				
2038	0	8,305	8,305				
2039	0	8,305	8,305				
2040	0	8,305	8,305				
2041	0	8,305	8,305				
2042	0	8,305	8,305				
2043	0	8,305	8,305				
2044	0	8,305	8,305				
2045	0	8,305	8,305				
2046	0	8,305	8,305				

The annual physical benefits of water supply were determined for each of the three land development scenarios that would occur if the project were not completed. The three land development scenarios are intensive grazing, vineyards, and ranchettes/hobby farms as presented in **Table 2-15**, **Table 2-16** and **Table 2-17**, respectively. These scenarios are compared to the with project conditions which would result in the Attiyeh Ranch being protected as open space in perpetuity.

**Table 2-15. Forecasted Annual Attiyeh Ranch Project Physical Benefits – Intensive Grazing**

Attiyeh Ranch Conservation Easement Project							
<b>Benefit Claimed:</b> Water supply							
<b>Measure of Benefit:</b> acre-feet							
<b>Additional Information:</b> Acre-feet of water lost from Nacimiento Reservoir over spillway if Attiyeh Ranch was not protected using a conservation easement, and was used for intensive grazing instead.							
Physical Benefits				Physical Benefits			
Year	Without Project	With Project	Change Resulting from Project	Year	Without Project	With Project	Change Resulting from Project
2013	0	0	0	2047	0	0	0
2014	0	0	0	2048	0	0	0
2015	0	0	0	2049	0	0	0
2016	0	0	0	2050	0	0	0
2017	0	0	0	2051	0	0	0
2018	0	0	0	2052	8,157	0	8,157
2019	0	0	0	2053	0	0	0
2020	0	0	0	2054	0	0	0
2021	7,785	6,113	1,672	2055	0	0	0
2022	0	0	0	2056	0	0	0
2023	89,650	78,060	11,590	2057	0	0	0
2024	0	0	0	2058	0	0	0
2025	0	0	0	2059	115	0	115
2026	0	0	0	2060	0	0	0
2027	0	0	0	2061	0	0	0
2028	0	0	0	2062	0	0	0
2029	0	0	0	2063	0	0	0
2030	0	0	0	<b>Comments:</b> Without the project, the Attiyeh Ranch could be developed for intensive grazing, thereby increasing water runoff during winter storm events and increasing the amount of water loss over the spillway. With the project, a conservation easement will prevent higher intensity land uses and avoid additional water loss than what currently exists today.			
2031	0	0	0				
2032	1,286	0	1,286				
2033	0	0	0				
2034	0	0	0				
2035	0	0	0				
2036	0	0	0				
2037	41,714	29,681	12,033				
2038	0	0	0				
2039	0	0	0				
2040	0	0	0				
2041	0	0	0				
2042	0	0	0				
2043	0	0	0				
2044	0	0	0				
2045	0	0	0				
2046	0	0	0				

**Table 2-16. Forecasted Annual Attiyeh Ranch Project Physical Benefits – Vineyard Development**

Attiyeh Ranch Conservation Easement Project							
<b>Benefit Claimed:</b> Water supply <b>Measure of Benefit:</b> acre-feet <b>Additional Information:</b> Acre-feet of water lost from Nacimiento Reservoir over spillway if Attiyeh Ranch was not protected using a conservation easement, and was used for vineyard development instead.							
Year	Physical Benefits			Year	Physical Benefits		
	Without Project	With Project	Change Resulting from Project		Without Project	With Project	Change Resulting from Project
2013	0	0	0	2047	0	0	0
2014	0	0	0	2048	0	0	0
2015	0	0	0	2049	0	0	0
2016	0	0	0	2050	0	0	0
2017	0	0	0	2051	0	0	0
2018	0	0	0	2052	8,157	0	8,157
2019	0	0	0	2053	0	0	0
2020	0	0	0	2054	0	0	0
2021	6,473	6,113	360	2055	0	0	0
2022	0	0	0	2056	0	0	0
2023	81,779	78,060	3,719	2057	0	0	0
2024	0	0	0	2058	0	0	0
2025	0	0	0	2059	115	0	115
2026	0	0	0	2060	0	0	0
2027	0	0	0	2061	0	0	0
2028	0	0	0	2062	0	0	0
2029	0	0	0	2063	0	0	0
2030	0	0	0	<b>Comments:</b> Without the project, the Attiyeh Ranch could be developed with vineyards, thereby increasing water runoff during winter storm events and increasing the amount of water loss over the spillway. With the project, a conservation easement will prevent higher intensity land uses and avoid additional water loss than what currently exists today.			
2031	0	0	0				
2032	472	0	472				
2033	0	0	0				
2034	0	0	0				
2035	0	0	0				
2036	0	0	0				
2037	31,918	29,681	2,237				
2038	0	0	0				
2039	0	0	0				
2040	0	0	0				
2041	0	0	0				
2042	0	0	0				
2043	0	0	0				
2044	0	0	0				
2045	0	0	0				
2046	0	0	0				

**Table 2-17. Forecasted Annual Attiyeh Ranch Project Physical Benefits – Ranchette Development**

Attiyeh Ranch Conservation Easement Project							
Benefit Claimed: Water supply							
Measure of Benefit: acre-feet							
Additional Information: Acre-feet of water lost from Nacimiento Reservoir over spillway if Attiyeh Ranch was not protected using a conservation easement, and was used for ranchette development instead.							
	Physical Benefits				Physical Benefits		
Year	Without Project	With Project	Change Resulting from Project	Year	Without Project	With Project	Change Resulting from Project
2013	0	0	0	2047	0	0	0
2014	0	0	0	2048	0	0	0
2015	0	0	0	2049	0	0	0
2016	0	0	0	2050	0	0	0
2017	0	0	0	2051	0	0	0
2018	0	0	0	2052	3,150	0	3,150
2019	0	0	0	2053	0	0	0
2020	0	0	0	2054	0	0	0
2021	6,492	6,113	379	2055	0	0	0
2022	0	0	0	2056	0	0	0
2023	81,968	78,060	3,908	2057	0	0	0
2024	0	0	0	2058	0	0	0
2025	0	0	0	2059	0	0	0
2026	0	0	0	2060	0	0	0
2027	0	0	0	2061	0	0	0
2028	0	0	0	2062	0	0	0
2029	0	0	0	2063	0	0	0
2030	0	0	0	Comments: Without the project, the Attiyeh Ranch could be developed with ranchettes, thereby increasing water runoff during winter storm events and increasing the amount of water loss over the spillway. With the project, a conservation easement will prevent higher intensity land uses and avoid additional water loss than what currently exists today.			
2031	0	0	0				
2032	668	0	668				
2033	0	0	0				
2034	0	0	0				
2035	0	0	0				
2036	0	0	0				
2037	32,031	29,681	2,351				
2038	0	0	0				
2039	0	0	0				
2040	0	0	0				
2041	0	0	0				
2042	0	0	0				
2043	0	0	0				
2044	0	0	0				
2045	0	0	0				
2046	0	0	0				

## **2.0 Measurement of Benefits**

The environmental stewardship, community/social, water quality, and water supply benefits will be measured by monitoring the ranch to ensure all easement conditions are being followed, consistent with Conservation Easement Monitoring Policy and Procedure. Natural resources and scenic open space are protected in the terms of the easement, thereby ensuring environmental stewardship benefit of the property. Land uses that would exacerbate soil erosion causing sedimentation in Nacimiento River are prohibited, further protecting the environmental stewardship benefit of the project. Development of roads using impervious materials and the development of homes within the easement area are also prohibited uses on the ranch, and therefore the water supply benefit of the project is protected by avoiding increased water runoff on the ranch.

Site monitoring activities include:

- Pre-monitoring Activities
- Scheduling the visit (at least annually)
- Reviewing project information
- Loading field bag
- Monitoring Activities
- Landowner coordination
- Site visit and photography
- Completion of monitoring checklist
- Post-monitoring Activities
- Complete and archive photographs, monitoring checklist, and monitoring map
- Mail post-monitoring letter to landowner

If there is a potential easement violation, initiate The Land Conservancy Enforcement of Easement Procedure.

## **2.1 Without Project Conditions**

Without the Attiyeh Ranch Conservation Easement Project, the 8,305 acre ranch could be subdivided and separately conveyed as allowed by San Luis Obispo and Monterey Counties. Development of those parcels would result in significant additional infrastructure, including roads, utilities, and individual septic systems. Development of the ranch would impact the ranch's natural resources by removing a portion of the existing habitat to convert land use from open space to more intensive uses. Land use conversion to higher intensity also exacerbates soil erosion leading to sedimentation of local waterways and degrades aquatic habitat. Increased development also fragments wildlife corridors for species that utilize the ranch as they migrate through the Central Coast.

Without the Attiyeh Ranch Conservation Easement, hiking on the ranch may never be realized. Currently the Ranch is entirely privately owned, and public access is not permitted. Future landowners may not be amiable to public access on the ranch and deny the public's access on the ranch. This would limit the amount of access to open space surrounding Nacimiento Reservoir to existing trails. Additionally, significant scenic impacts could occur in an important and treasured recreational resource should a maximum build-out scenario be realized.



Without the Attiyeh Ranch Conservation Easement, the ranch could be separately conveyed and developed with higher intensity land uses such as intensive grazing, vineyards, ranchettes and hobby farms. Land use changes on the ranch would impact the hydrology and increase runoff during winter storm events. This scenario would lead to water loss at Nacimiento Reservoir that would otherwise be retained for municipal water supply during summer months. Using a hydrologic model, it was determined that intensive grazing would cause a 25% increase in runoff compared to the current land use on Attiyeh Ranch, over 25 years or more. The model further reveals a 14% increase in runoff for vineyards and a 10% increase in runoff for ranchettes and hobby farms. The water from Nacimiento Reservoir is a valuable municipal water supply for several cities in San Luis Obispo County. Without water from the reservoir, these cities would be forced to obtain water from State Water, which is extremely costly.

## **2.2 Potential Adverse Physical Effects**

Although some individuals would see the conservation easement on the Attiyeh Ranch as a hindrance for community development, the conservation easement provides positive physical effects for the Attiyeh Ranch and the scenic, open space, natural, and recreational resources it would provide now, and in perpetuity.

## **2.3 Project Contacts**

The Land Conservancy of San Luis Obispo County  
Stacey Smith, Conservation Project Manager  
547 Marsh St., San Luis Obispo, CA 93401  
(805) 544-9096

## Project 3. Livestock and Land Program

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Agriculture is a driving economic force and predominant land use in San Luis Obispo County. The 2007 *Census of Agriculture, Vol. 1*<sup>17</sup> estimates that San Luis Obispo County has 940 horse farms with 8,816 horses and 726 ranches with 56,830 cattle. These numbers have likely grown, with the 2011 *Crop Report*<sup>18</sup> put out by the County Ag Commissioner's office estimating 81,000 cattle. The impacts of these facilities on resources often relate to the management of manure, stormwater, groundwater, creeks and soils. Nitrate, sediment and pathogen pollution problems from livestock facilities are identified in numerous plans at both the regional level and County level.

Led by the Region's two primary Resource Conservation Districts (RCDs) – Upper Salinas-Las Tablas and Coastal San Luis, the Livestock and Land Program will address natural resource concerns faced by livestock owners by providing education, technical assistance and cost share for implementation of management measures. Water quality improvements will be achieved by giving livestock owners the tools to complete water quality site assessments and to implement Best Management Practices near listed waterways. The behavioral and management practice changes achieved by this program will provide immediate and lasting water quality and watershed improvements by reducing the off-site mobilization of manure, urine and sediments from livestock facilities. The program will make significant progress toward watershed goals listed in Total Maximum Daily Loads (TMDLs) and watershed plans.

### 3.0 Project Need

Achieving water quality goals and protecting beneficial uses of water supply resources is critical to the San Luis Obispo County Region (Region). See **Figure 2-6** for boundaries. A Master Water Plan<sup>1</sup> for the County was developed to summarize District water conditions, including; cyclical droughts, declining groundwater levels, degradation of groundwater quality, and the limited availability of surface water supplies. The Master Water Report details the importance for all entities in San Luis Obispo County to effectively protect the water quality and beneficial uses of water resources to protect public health and safety, maintain viable ecosystems, avoid seawater intrusion, and allow for sustainable agriculture.

The surface water and groundwater quality problems of nitrate, sediment and pathogen pollution from livestock facilities are identified in numerous plans at the regional level including:

- Central Coast Regional Water Quality Control Board, Basin Plan<sup>19</sup>
- California's Nonpoint Source Pollution Control Program Plan, Management Measures for Agriculture<sup>20</sup> (2000)

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<sup>17</sup> United States Department of Agriculture. "Census of Agriculture." 2007.

<sup>18</sup> San Luis Obispo County Department of Agriculture. "2011 Annual Report." 2011.

<sup>19</sup> Regional Water Quality Control Board, Central Coast Region State Water Resources Control Board California Environmental Protection Agency. "Water Quality Control Plan for the Central Coastal Basin." 2011

- Agricultural nonpoint source water pollution policy: The case of California's Central Coast<sup>21</sup>
- Agricultural Management Measures<sup>22</sup>
- Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (January 1993)<sup>23</sup>



Figure 2-6. *Project Site Map - Livestock and Land*

**Figure 2-6** above shows the boundaries of both Conservation Districts. The pilot projects associated with this program could occur at any known impacted waterway within these boundaries.

In San Luis Obispo County, the sediment, nutrient and pathogen pollution from livestock facilities have been noted in the following plans (Exhibit C):

<sup>20</sup> California State Water Resources Control Board, California Coastal Commission “Nonpoint Source Program Strategy and Implementation Plan, 1998-2013 (PROSIP).” 2000.

<sup>21</sup> Dowd, B.M., Press, D., Los Huertos, M. “Agricultural nonpoint source water pollution policy: the case for California’s Central Coast.” 2008.

<sup>22</sup> United States Environmental Protection Agency. “Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Chapter 2 Measures for Agriculture Sources.” 1993.

<sup>23</sup> United States Environmental Protection Agency. “Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters.” 1993.

- Morro Bay Comprehensive Conservation and Management Plan, Action Plans, Agriculture and Grazing
- Pismo Creek Watershed Management Plan, Recommendations
- Grazing Lands Management Plans for Monterey County Water Resources Agency land within the Nacimiento and San Antonio River Watersheds
- San Luis Obispo Creek Watershed Waterway Management Plan, Watershed Management Framework
- Salinas River Watershed Action Plan
- Santa Rosa Creek Watershed Management Plan
- Paso Robles Basin Groundwater Management Plan

### 3.0.1 Surface Water

Twenty one (21) surface waterbodies in the project region are listed on the 303(d)<sup>3</sup> listing for target pollutants related to livestock operations, as shown in **Table 2-18**. The activities in this project support implementation of the TMDLs adopted or in progress.

**Table 2-18. San Luis Obispo County Surface Water Bodies on 303d Listing**

Creek	2010 303(d) Listing	TMDL Status
1. Arroyo Grande Creek	fecal coliform, e. coli	TMDL completion 2021
2. Arroyo De La Cruz	e. coli, dissolved oxygen	TMDL completion 2021
3. Atascadero Creek	e. coli, fecal coliform, dissolved oxygen	TMDL completion 2021
4. Cholame Creek	Metals, salinity, nutrients, pathogens	TMDL completion 2021
5. Estrella River	Metals, salinity, pathogens, pH	TMDL completion 2021
6. Oso Flaco Creek	Nutrients, salinity, pathogens, sediment	TMDL completion 2021
7. Upper Salinas River	Chloride, sodium, pH	TMDL completion 2021
8. San Simeon Creek	Chloride, nitrate, dissolved oxygen, sodium	TMDL completion 2021
9. Santa Rosa Creek	Temperature	TMDL completion 2021
10. Los Berros Creek	nitrate, chloride, sodium	TMDL completion 2021
11. Morro Bay	pathogens, sediment	TMDL approval 2004
12. Chorro Creek	pathogens, sediment, nutrients	TMDL approval 2004 and 2007
13. Los Osos Creek	nutrients, sediment, dissolved oxygen, fecal coliform	TMDL approval 2004 and 2005. Dissolved oxygen TMDL completion 2021
14. Dairy Creek	fecal coliform, dissolved oxygen	TMDL approval 2004
15. Pennington Creek	fecal coliform	TMDL completion 2021
16. Warden Creek	fecal coliform, nitrate, dissolved oxygen	TMDL approval 2004 and 2005. Dissolved oxygen TMDL completion 2021
17. Nipomo Creek	fecal coliform, nitrate	TMDL completion 2013
18. Pismo Creek	fecal coliform, e.coli, dissolved oxygen	TMDL completion 2021
19. San Luis Obispo Creek	nitrate, fecal coliform, pathogens	Multiple TMDLs
20. Prefumo Creek	fecal coliform, nitrate, turbidity	TMDL completion 2021
21. Stenner Creek	fecal coliform	TMDL completion 2021

The Livestock and Land Program will make significant progress toward surface water quality goals listed in TMDLs and watershed plans. Over 12 beneficial uses are identified in the Basin Plan for the surface waters in the watersheds in the San Luis Obispo region. Some of the critical beneficial uses include municipal and domestic supply, agricultural supply, ground water recharge, freshwater replenishment and wildlife habitat. The Livestock and Land Program is specifically designed to target watersheds with TMDL listings for sediment, nutrients and pathogens. The project will promote the reduction of nutrient, sediment and pathogen pollution currently impairing these beneficial uses. This will be achieved by implementing Best Management Practices (BMPs) on livestock facilities on or near listed waterways and by giving

livestock owners the tools to complete water quality site assessments and implement BMPs on their property now and into the future.

### 3.0.1 Groundwater

Groundwater is the Region's primary water supply supplying nearly 80 percent of the county's water supply. There are 30 groundwater basins recognized in San Luis Obispo County. The Master Water Report lists the TMDL and pathogen concerns by groundwater basin in **Table 2-19**.

**Table 2-19. Groundwater TMDL/Pathogens Chart**

Subregion	Groundwater Basin/ Community	Reference to Nitrates or Fecal Coliforms	Master Water Report Section
North Coast	Morro Valley Groundwater Basin	Nitrates as a predominant concern for water quality in the basin	4.2.1.4.1
North Coast	Chorro Valley Groundwater Basin	Nitrate concentrations are a concern for water quality in the lower portion of the basin	4.2.1.5
North Coast	City of Morro Bay	Excessive nitrates; Elevated nitrates are a constraint for drinking water availability at the City of Morro Bay well field	4.6.6.4.1 4.8.12.4
North Coast	Los Osos Valley Groundwater Basin	Nitrates are the primary constituent of concern in the upper aquifer.	4.2.1.6.1
South County	San Luis Valley Subbasin	Nitrates are one of the constituents of greatest concern at varying locations within this basin	4.2.2.1.2
South County	City of San Luis Obispo	Occasional spikes in the nitrate content of well water	4.6.7.1.1
South County	Cal Poly San Luis Obispo	Increases in nitrate levels have been measured	4.6.7.1.2
South County	San Luis Obispo/Avila	Elevated nitrates are a constraint for drinking water availability at some of the City of San Luis Obispo wells	4.8.13.1
South County	Nipomo Valley Subbasin	Nitrate no detect	4.2.2.2.6
South County	Northern Cities Management Area	Nitrate: Six of 35 wells tested exceeded the State drinking water standard for nitrate, which has been a concern in the area.	4.2.2.2.7
South County	Nipomo Mesa Management Area	Nitrate has been detected in excess of the drinking water standard in relatively few wells	4.2.2.2.8
South County	Santa Maria Valley Management Area	Nitrates are also a concern in several areas of the valley, although the majority of groundwater sample results in the San Luis Obispo County portion of the valley are below the MCL (DWR 2002)	4.2.2.2.9
South County	NCMA: City of Arroyo Grande	Some of the shallower wells drawing water with high nitrate levels	4.6.7.2.5
South County	NCMA: City of Grover Beach	Groundwater from the Paso Robles formation meets all state and federal standards except for nitrate concentration	4.6.7.2.5
South County	Nipomo Mesa Management Area	Nitrate levels are increasing in wells near the Southland WWTF	4.6.7.2.6

**Table 2-19. Groundwater TMDL/Pathogens Chart, Continued**

Subregion	Groundwater Basin/ Community	Reference to Nitrates or Fecal Coliforms	Master Water Report Section
South County	Cuyama Valley Groundwater Basin	Nitrate content reached 400 mg/L in some shallow wells (DWR 2003; County of Santa Barbara Planning and Development Department, 1994).	4.2.2.4.1
North County	Carrizo Plain: Topaz Farm	Exceed the drinking water standard for nitrate	4.6.8.1.2
North County	Santa Margarita Valley Groundwater Basin	Total coliform, fecal coliform, and Escherichia coli data were reviewed by Todd (2004) and found to be suggestive, although not conclusive, of small impacts on both shallow and deep aquifer wells from local wastewater disposal systems.	4.2.3.3.1
North County	Santa Margarita Valley Groundwater Basin	Based on a review of available water quality data by Todd (2004), all shallow and deep wells sampled for nitrate have measured concentrations below the maximum contaminant level (MCL) of 45 mg/L.	4.2.3.3.1
North County	Paso Robles Groundwater Basin	Increasing nitrates in the Paso Robles Formation in the area north of Highway 46, between the Salinas River and the Huer Huero Creek; and Increasing nitrates in the Paso Robles Formation in the area south of San Miguel; increasing nitrate concentrations in City of Paso Robles	4.2.3.5.1 4.6.8.5.3

**Reference:** 2012 Master Water Report<sup>1</sup>

Managing contamination from livestock facilities is a critical component of achieving the Region's water quality goals and protecting the beneficial uses of both surface water and groundwater. However, a large portion of horse owners in the Region are located on ranchettes and hobby farms where livestock management is not a primary source of income. In addition, such horse facilities often do not meet eligibility requirements for Natural Resource Conservation Service assistance, resulting in a lower level of technical and financial support for implementing BMPs, and other education and assistance resources are limited.

### 3.0 Project Development and Selection

Managing contamination from livestock facilities can be accomplished one of two ways, either through regulatory mandate and oversight or through voluntary land management changes. The regulatory approach involves top-down regulation by the State Water Resources Control Board (SWRCB) where implementation is enforced through a TMDL or Order. The voluntary approach involves providing willing livestock and landowners with the tools necessary to reduce pollutant loading.

Aside from potential regulatory requirements that may occur sometime in the next ten years, there are currently no programs that dissuade or incentivize these livestock owners from making any changes to their pasture layouts or livestock grazing patterns and behaviors, which is compounding a county-wide problem.

The Livestock and Land Program was selected for its ability to address multiple water resource management concerns on a watershed scale, and with encouragement from the Regional Water

Quality Control Board (RWQCB) staff to lead a voluntary program that reduced pollutant loading thereby reducing the need for future regulatory actions related to National Pollutant Discharge Elimination System (NPDES) and Clean Water Act for livestock facilities.

### **3.1 Project Description**

This project furthers a comprehensive watershed approach by bringing together a wide variety of people working on water quality issues throughout the Region including landowners, private business owners and interested citizens. During implementation, project design and water quality site planning activities are highly collaborative. Technical experts such as National Resource Conservation Service (NRCS), U.C. Cooperative Extension (UCCE), County officials, RCDs and local specialist assist landowners to conquer site-specific erosion and manure management challenges. Project managers prioritize activities identified in local and regional watershed management plans (i.e. TMDL and 303(d) listings) thus increasing coordination among all stakeholders within each targeted watershed. Because the program will operate on a Region-wide basis, solutions will be promoted and prioritized for site implementation that benefits the entirety of the watersheds being worked in.

Actions required to obtain the physical benefits include:

- Site visits and consultations with landowners,
- Development and delivery of workshops and trainings,
- Dissemination of pre-established publications and brochures,
- Livestock and landowner access to expert technical assistance, and
- Funding assistance via cost-shared plan implementation projects.

Project managers will work with a local Stakeholder and Technical Advisory Committee (STAC) consisting of local livestock managers and technical specialists (private, NRCS, University and USFWS) to develop the scope for implementation of water quality and wildlife habitat improvement practices. Through site visits, landowners will have one-on-one interaction with RCD and NRCS conservation planners who will provide site assessment, detailed recommendations and design assistance. Three to eight priority sites will be selected among livestock facility applicants to implement water quality and wildlife habitat improvement projects. Specific BMPs implemented and natural resource improvements will vary based on-site need and projects selected and will be designed by the STAC and consultants. Landowners receiving cost share funding for implementation will enter into an agreement with the RCD to maintain the practice as designed.

Projects tend to be small and on impacted lands. It is expected that most of the projects will fall into a CEQA exemption or fall under an existing Mitigated Negative Declaration for the Partners In Restoration Permit Coordination Program. Permits will be identified by project site. Projects tend to be on highly impacted lands that do not trigger environmental permit requirements. Projects can often be planned, permitted and constructed in one year. Plans and specifications will be developed during the grant contract. All BMPs will be designed to NRCS Conservation



Practice Standards available on Field Office Technical Guide (eFOTG). BMPs may include, but are not exclusive to:

- Access Road
- Composting Facility
- Critical Area Planting
- Filter Strip
- Grade Stabilization Structure
- Grassed Waterway
- Stormwater Runoff Control
- Stream Crossing
- Stream Habitat Improvements
- Underground Outlet

These management practices will be incorporated into a pasture management design. Pastures will be redesigned to minimize mud and erosion, and to properly manage manure storage piles. Elements within the pastures will then be evaluated and reconfigured, including:

- Creating paddock management plans that address indoor and outdoor issues,
- Developing site specific drainage and erosion control plans, and
- Highlighting sensitive areas for protection.

Plan implementation will be performed publicly to allow neighboring farms and ranches to learn by demonstration. Incentives are also provided via public recognition for BMP use and cost share for site improvements.

## 3.2 Project Physical Benefits

The Livestock and Land Program delivers the following physical benefits:

- **Surface Water Quality Benefits:** 30% reduction in pollutant loading to surface waters.
- **Groundwater Quality Benefits:** Reduction in potential nitrates leaching into groundwaters especially adjacent to domestic wells, and increased infiltration to groundwater in pastures.

Secondary benefits include habitat and educational benefits. Approximately 70 acres of managed land offers improved vegetative health and cover density and improved streambank stability in those instances where livestock are relocated. The program also promotes a change to the livestock and landowner culture, educating the owners and eliminating barriers by providing technical assistance for water quality site plans and project implementation.

The goal of the Livestock and Land Program is to achieve immediate and lasting reductions in nutrient, sediment and pathogen pollution to surface and groundwater and enhance wildlife habitat through implementation of BMPs on livestock facilities and rangelands throughout the Region.

Stormwater flowing off of domestic or commercial livestock properties carries sediments and pathogens downstream, causing erosion, and destructing downstream surface waters and groundwater. Preventing contaminated stormwater runoff from these sites will protect the quality and beneficial uses of the surface water and groundwater.

This project was specifically designed to target watersheds with TMDL listings for sediment, nutrients and pathogens. The pollutant reduction estimates were projected based on percent reductions achieved by individual sites implemented in Santa Cruz and Monterey Counties through a similar program. Load reduction estimates vary by site, but a 75% reduction of pathogens and 50% reduction of sediment transport into surface waters can be expected from projects that divert water from or remove pollutant sources. Other practices such as re-vegetation and drainage management have more modest load reductions. Overall, a reduction of pollutant loads by 30% on an estimated 70 acres of livestock facility project sites is expected based on similar activities in Santa Cruz and Monterey Counties.

These load reductions were measured by a Load Reduction Modeling (LRM) tool developed and tested specifically for the Livestock and Land Program. The LRM uses site specific information to compute annual loads for the amount of manure produced, as well as the primary constituents of concern, nutrients, pathogens, and sediments. The annual loading of contaminants is calculated first using existing and proposed site conditions to quantify the sediment, pathogen, and nutrient generation at the site. Then, management practices are taken into consideration, applying removal efficiency to predict the effectiveness of BMPs at the respective site.

The effectiveness of the program will be measured through:

- Participant surveys,
- Before and after site load reduction modeling, and
- Site-specific erosion and runoff assessments.

Participant surveys will be conducted to measure the percentage of target audience reached, number of BMPs implemented, total acreage of livestock facilities improved, before and after surveys to measure efficacy of technical assistance, and percent increase in overall program participation. All projects will be photo documented.

To estimate water quality improvements for each site, the LRM will be employed for before and after conditions. The LRM uses site specific information to compute annual loads for the amount of manure produced, as well as the primary constituents of concern, nutrients, pathogens, and sediments. The annual loading of contaminants is calculated first using existing and proposed site conditions to quantify the sediment, pathogen, and nutrient generation at the site. Then, management practices are taken into consideration, applying removal efficiency to predict the effectiveness of BMPs at the respective site. The LRM results will:

1. Assist in the future roll-out of the program,
2. Facilitate the understanding of the impact a livestock facility has in a specific area, and
3. Evaluate the effectiveness of implementing specific BMPs to improve water quality on that site.

An additional benefit accomplished by the program is a change to the livestock and landowner culture. The project uses a cutting edge social science approach. Community Based Social Marketing (CBSM) identifies the barriers and incentives that affect behavior. The Livestock and Land Program applies the CBSM approach to help livestock owners change polluting behavior. The program will help livestock and landowners overcome knowledge barriers by providing technical assistance for water quality site plans and project implementation. Livestock managers

need assistance to overcome barriers to managing their facilities cost-effectively while protecting water quality. Current barriers include:

- Challenging site conditions,
- Historical co-locating of livestock near creeks and streams, and
- Lack of finances, time and information about (and peer support for) protective site management practices.

### **3.3 Measurement of Benefits**

There is always uncertainty around quantifying project benefits related to pollutant load reduction estimation methods and landowner commitment. To specifically measure the pollutant load reductions due to BMP implementation on project sites is extremely difficult due to the uncontrolled nature and diversity of variables not only on the site, but also because the target pollutants have other sources upstream from the sites (landslide loading of sediment for example). Participating landowners are typically very dedicated to the success and long term management of the practices implemented on their property. However, due to inconsistent long term funding for the Livestock and Land Program follow-up can be challenging after the end of the grant contract.

### **3.4 Without Project Conditions**

Without the Livestock and Land Program, landowners would likely continue business as usual. The current land management approach has led to existing water quality impairments by sediment, nutrients and pathogens as demonstrated by the list of 21 impaired water bodies. TMDLs related to livestock and grazing would likely be addressed by the RWQCB on a slower timeline with less consistency between watersheds and with fewer Region-wide benefits.

Assumptions for water quality benefits are based on modeling calculations described in the Fall Creek, 2009 document, and the following parameters:

- The data used in the predictive analysis model calculations is derived from two sources: 1) the user input data based on site-specific information and 2) published data.
- Horses produce 50 lbs of manure per day.
- Each day, an average adult horse can defecate approximately 0.28 pounds of nitrogen and 0.11 pounds of phosphorus.
- Published data from equestrian facilities show that  $2.6 \times 10$  and  $4.2 \times 10$  colonies of total streptococcus and fecal coliform are produced per day, respectively.

The total amount of sediment lost is calculated based on the Universal Soil Loss Equation.

Assuming the site has 1 horse on 1 acre of land, and that the site is 500 ft from the nearest creek in area receiving 0.4 inches of precipitation, the resulting annual pollutant loads are shown in **Table 2-20**.

**Table 2-20. Annual Pollutant Loads**

Pollutant		Annual Load	Units
Manure		9.13	tons
Nutrients			
	Total Nitrogen	102.20	lbs
	Total Phosphorus	40.15	lbs
Pathogens			
	Total Streptococcus	9.49E+13	colonies
	Fecal Coliform	1.53E+11	colonies

It is too difficult to estimate sediment loads benefits without knowing the site specific characteristics. However, most projects will also have reductions to sediment loading that will be calculated with the predictive analysis model.

The primary surface water and groundwater quality benefits for with and without project conditions are presented in the tables **Table 2-21** and **Table 2-22** below for an assumed 70 acres.

### 3.0 Potential Adverse Physical Effects

There are no potential adverse physical effects associated with this program. There are some existing conflicts between livestock and landowners and the agencies proposing regulatory actions to manage water quality impacts from these lands. This program will help reduce that conflict by implementing an incentive for voluntary participation in a program that delivers the water quality benefits established by the RWQCB.

**Table 2-21. Livestock and Land Program Annual Physical Benefits – Surface Water Quality**

Livestock and Land Program			
<b>Benefit Claimed:</b> Surface water quality			
<b>Measure of Benefit:</b> load			
<b>Additional Information:</b> The measure is tons of manure, pounds of nutrients, and colonies of pathogens			
Year	Physical Benefits		
	Without Project	With Project	Change Resulting from Project
2013	n/a	n/a	n/a
2014	No reduction in Manure, Pathogens, Nutrients, or Sediment. Annual pollutant loading for 70 acres based on assumptions above are: Manure 630 tons Nutrients 9,940lbs Pathogens 6.65E+15 colonies	Increased knowledge of best management practices leading to improved water quality benefits.	Increased implementation of best management practices without State funding.
2015	Same as previous years	Implementation of at least one project site on 8 acres resulting in 30% reduction to annual pollutant load of Manure 72 tons*.30 reduction = 21.6 tons Nutrients 1,136 lbs *.30 reduction = 341 lbs Pathogens 7.60E+14 colonies*.30 reduction = 2.28E+14 colonies	Difference: Manure 608 tons Nutrients 8,804 lbs Pathogens 1.33E+14 colonies
2016	Same as previous years	Implementation of at least three additional project sites on estimated 62 acres resulting in annual pollutant load of: Manure 558 tons*.30 reduction = 167 tons Nutrients 8,804 lbs*.30 reduction = 2,641 lbs Pathogens 5.89E+15 colonies*.30 reduction = 1.77E+15 colonies	Difference: Manure 463 tons Nutrients 7,299 lbs Pathogens 1.67E+15 colonies
Last year			

**Table 2-22. Livestock and Land Program Annual Physical Benefits – Groundwater Quality**

Livestock and Land Program			
<b>Benefit Claimed:</b> Groundwater Quality			
<b>Measure of Benefit:</b> acres			
<b>Additional Information:</b> Reduced nitrate levels in groundwater will not be measured but the number of acres managed will be measured			
Year	Physical Benefits		
	Without Project	With Project	Change Resulting from Project
2013	n/a	n/a	n/a
2014	No reduction in Pathogens, Nutrients, Sediment	Increased knowledge of best management practices leading to improved water quality benefits.	Increased implementation of best management practices without State funding.
2015	Same as previous years	Implementation of best management practices on up to 8 acres of grazing land	Reduction in potential nitrates leaching into groundwaters especially adjacent to domestic wells, and increased infiltration to groundwater in pastures
2016	Same as previous years	Implementation of best management practices on up to 62 acres of grazing land	Reduction in potential nitrates leaching into groundwaters especially adjacent to domestic wells, and increased infiltration to groundwater in pastures
Last year			
<b>Comments:</b> Uncertainty around project benefits is related to pollutant load reduction estimation methods and landowner commitment. To specifically measure the pollutant load reductions due to BMP implementation on project sites is extremely difficult due to the uncontrolled nature and diversity of variables not only on the site, but also because the target pollutants have other sources upstream from the sites (landslide loading of sediment for example).			

### 3.0 Project Contacts

Coastal San Luis RCD  
Nicole Smith, Conservation Programs Manager  
645 Main Street, Ste. F, Morro Bay, CA 93442  
(805) 471- 9480

Upper Salinas-Las Tablas RCD  
Laura Edwards, Executive Director  
65 S. Main St. #107, Templeton, CA 93465  
(805) 434-0396

## Project 4. Shandon State Water Turnout Project

The community of Shandon is located in the North County Subregion of the San Luis Obispo County IRWM Region (Region) as shown in 0 below. Shandon currently relies solely on groundwater from the Paso Robles Groundwater Basin as its only water supply. The Paso Robles Groundwater Basin supplies water for 29 percent of the Region’s population and 40 percent of the Region’s agricultural production.

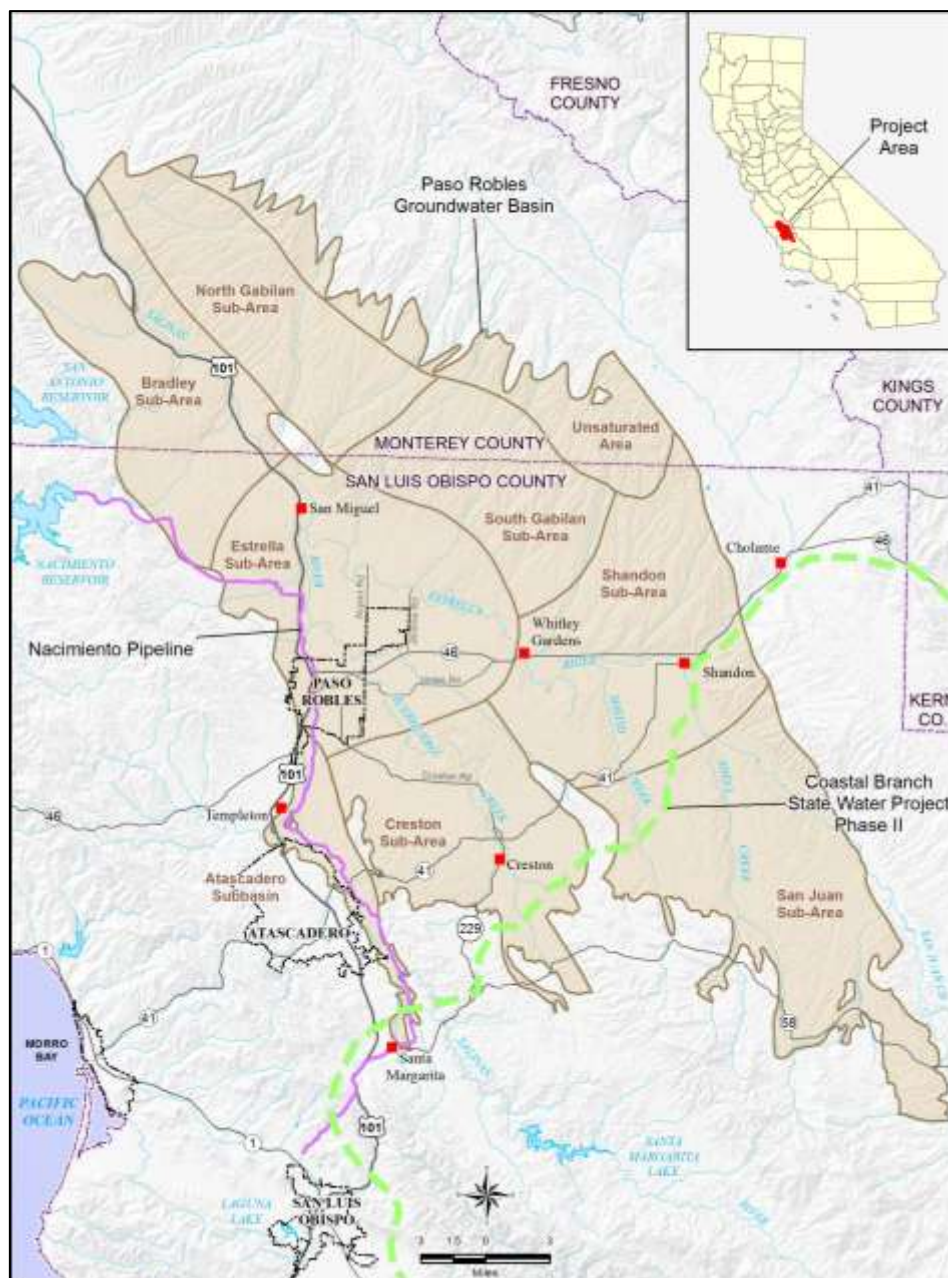


Figure 2-7. *Shandon Vicinity Map*



The County is proposing to construct a water turnout facility that will connect the water distribution system for County Service Area 16 (CSA 16) in Shandon to the existing Coastal Branch, Phase II State Water Project pipeline (48-inch, steel) near the intersection of San Juan Road and Toby Way in Shandon. The Shandon State Water Turnout Project will allow CSA 16 to access and distribute its State Water allocation of 100 acre-feet per year that was obtained in 1992.

The Shandon State Water Turnout Project will allow the community of Shandon to access its existing allocation of State Water. This new water supply source will improve regional water supply reliability and security by reducing pumping from the Paso Robles Groundwater Basin, which has reached its yield and whose water levels have been declining significantly. It will also diversify Shandon's water portfolio so that it has a source other than groundwater, which is susceptible to drought impacts, declining water levels and well contamination.

## 4.0 Project Need

Shandon currently relies solely on groundwater from the Paso Robles Groundwater Basin (Paso Basin) as its only water supply. From 2005 to 2012, CSA 16's average yearly water demand, comprised entirely of pumped groundwater, was 149 acre-feet<sup>24</sup> from July 2005 to June 2012.

The Paso Robles Groundwater Basin is located in northern San Luis Obispo County and southern Monterey County, encompassing an approximate area of 790 square miles (See **Figure 2-8**). The Paso Robles Groundwater Basin supplies water for 29 percent of the County's population and 40 percent of the County's agricultural production. Most of the municipal, industrial, commercial, domestic and agricultural entities in the Paso Robles Groundwater Basin area rely exclusively on groundwater to meet water demands.



Figure 2-8. *CSA 16 Boundary Map*

<sup>24</sup> Water usage reported by Tom Trott, Project Manager-Utilities Division

The Paso Robles Groundwater Basin Management Plan reports that groundwater use has increased over the last 30 years to the point where the Paso Robles Groundwater Basin outflows (including groundwater pumping) will soon be greater than basin inflows. It also reports significant declines in the basin’s groundwater levels since 1980. For the Shandon Subarea, the portion of the Paso Robles Groundwater Basin where Shandon is located, groundwater elevations declined by about 65 feet from 1981 to 2009 (rainfall over this period was slightly above average). From 2006 to 2009 alone, groundwater levels declined by about 30 feet in response to a combination of increasing water demands met by groundwater and consecutive dry hydrologic years. Over the same period other subareas of the Paso Robles Groundwater Basin experienced even more significant groundwater level declines as shown in **Figure 2-9** below.

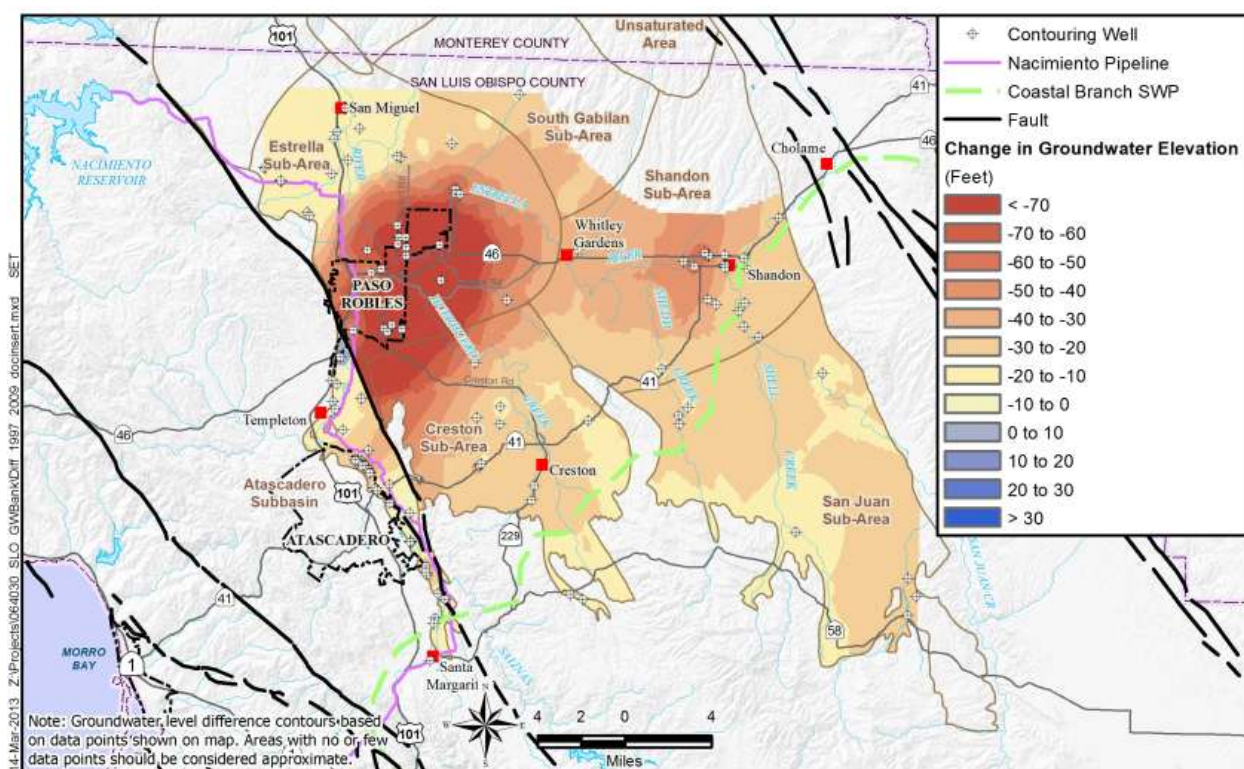


Figure 2-9. *Paso Basin Changes in Groundwater Elevation – 1997-2009*

In 2011, the County Board of Supervisors certified the Paso Robles Groundwater Basin as a Level of Severity III<sup>25</sup> water supply, in accordance with the designations provided by the County’s Resource Management System. This is the most severe designation that can be given to a water supply and is only designated when the amount of consumption has reached the dependable supply of the resource or the dependable supply will be depleted before new supplies are developed. The Paso Robles Groundwater Basin’s severity designation is mainly a result of the studies and findings included in the Paso Robles Groundwater Basin Management Plan<sup>26</sup>.

<sup>25</sup> San Luis Obispo County Board of Supervisors. “February 1, 2011 Meeting Minutes.” 2011.

<sup>26</sup> San Luis Obispo County. “Paso Robles Groundwater Basin Management Plan”. 2011.

Declining basin groundwater levels is a major water supply reliability concern for Shandon. Relying solely on the Paso Robles Groundwater Basin also presents the following other reliability concerns:

- Drought impacts on groundwater levels
- Negative water quality impacts resulting from declining groundwater levels
- Well contamination
- Climate change impacts on groundwater levels

Declining basin groundwater levels also present potential water rights problems for the Shandon community. As currently interpreted, California water rights indicate that overlying groundwater rights are superior to appropriative groundwater rights. Overlying groundwater rights are the rights of a property owner with property located above a common aquifer to reasonable use of that aquifer. CSA 16's groundwater rights are considered appropriative groundwater rights. Thus, if there is not a surplus in the Paso Robles Groundwater Basin after all reasonable and beneficial overlying rights are satisfied, CSA 16's appropriative groundwater rights could potentially be challenged by entities with overlying groundwater rights.

In foresight of some of the above-mentioned water supply concerns, Shandon contracted with the San Luis Obispo County Flood Control and Water Conservation District (District) in 1992 to obtain an allocation of 100 acre-feet per year (AFY) of State Water from the Coastal Branch of the State Water Project<sup>27</sup>. The Shandon State Water Turnout Project will allow CSA 16 to access and distribute its already allocated 100 acre-feet per year of State Water that was obtained in 1992. This will enable Shandon to reduce groundwater pumping from the Paso Robles Groundwater Basin, thus, reducing demands on the basin and protecting the water source for Shandon and all Paso Robles Groundwater Basin groundwater users. The project will also provide Shandon with better water supply reliability.

## **4.0 Project Development and Selection**

Several water supply project alternatives were considered and documented in the 1992 State Water Project Coastal Branch, Phase II, Local Distribution Lines and Facilities Final Environmental Impact Report<sup>28</sup> (1992 FEIR), including:

- Whale Rock Exchange
- Delivery of Water from Nacimiento Reservoir
- Jack Creek Reservoir
- Santa Rita Reservoir
- Lopez Reservoir Enlargement
- Wastewater Reclamation
- Desalination
- Increased Water Conservation

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<sup>27</sup> San Luis Obispo County Flood Control and Water Conservation District. "Water Supply Agreement between San Luis Obispo County Flood Control And Water Conservation District and County of San Luis Obispo." May 15, 1992.

<sup>28</sup> County of San Luis Obispo. "Final Environmental Impact Report, State Water Project Coastal Branch (Phase II)." 1992.

Each of these alternatives were evaluated against the following project selection criteria:

- Water supply reliability
- Project cost
- Water quality
- Engineering constraints
- Environmental impacts

Based on the evaluation documented in the 1992 EIR, obtaining State Water from the Coastal Branch of the State Water Project via the Shandon State Water Turnout Project was selected as the preferred alternative, but the facility was never constructed due to financial infeasibility. In response to the Paso Robles Groundwater Basin Management Plan, which was developed with input from many stakeholders in the basin, Shandon re-initiated the State Water Turnout Project and prepared the 2012 Addendum to the 1992 FEIR<sup>29</sup>. The 1992 FEIR and 2012 Addendum provide water supply alternatives comparison and justify the need for the Shandon State Water Turnout Project.

## 4.1 Project Description

The proposed Shandon State Water Turnout Project is a new turnout facility that will connect the existing CSA 16 water distribution pipeline (10-inch, PVC) to the existing Coastal Branch, Phase II State Water Project pipeline (48-inch, steel) near the intersection of San Juan Road and Toby Way in Shandon, CA. The turnout facility will be designed to receive 100 AFY spread equally over each month of the year. **Figure 2-10** depicts the facility that will be constructed as part of the Shandon State Water Turnout Project. Construction of the facility will generally consist of the following:

- Piping connection to an existing 10-inch flange stubbed from the 48-inch SWP pipeline
- Construction of an underground concrete vault to house the turnout equipment
- Installation of turnout equipment, including piping, an actuated flow control valve, isolation valves, flow meter, air release valves and drain valves
- Installation and programming of control equipment for incorporation into the existing SWP Supervisory Control and Data Acquisition (SCADA) system, including connection to the existing SWP fiber optic line running parallel to the SWP pipeline
- Installation of electrical equipment, including connection to existing power, and backup power supply equipment
- Piping connection to the existing CSA 16 10-inch PVC pipeline

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<sup>29</sup> County of San Luis Obispo. “Addendum to the EIR, Shandon (CSA 16) State Turnout Project ED 90-649 (300462).” 2012.

- Upgrades to CSA 16 well water treatment facilities to provide chloramine treatment to match SWP water treatment (existing CSA 16 well treatment is chlorine and mixing the two treatments can cause health hazards)

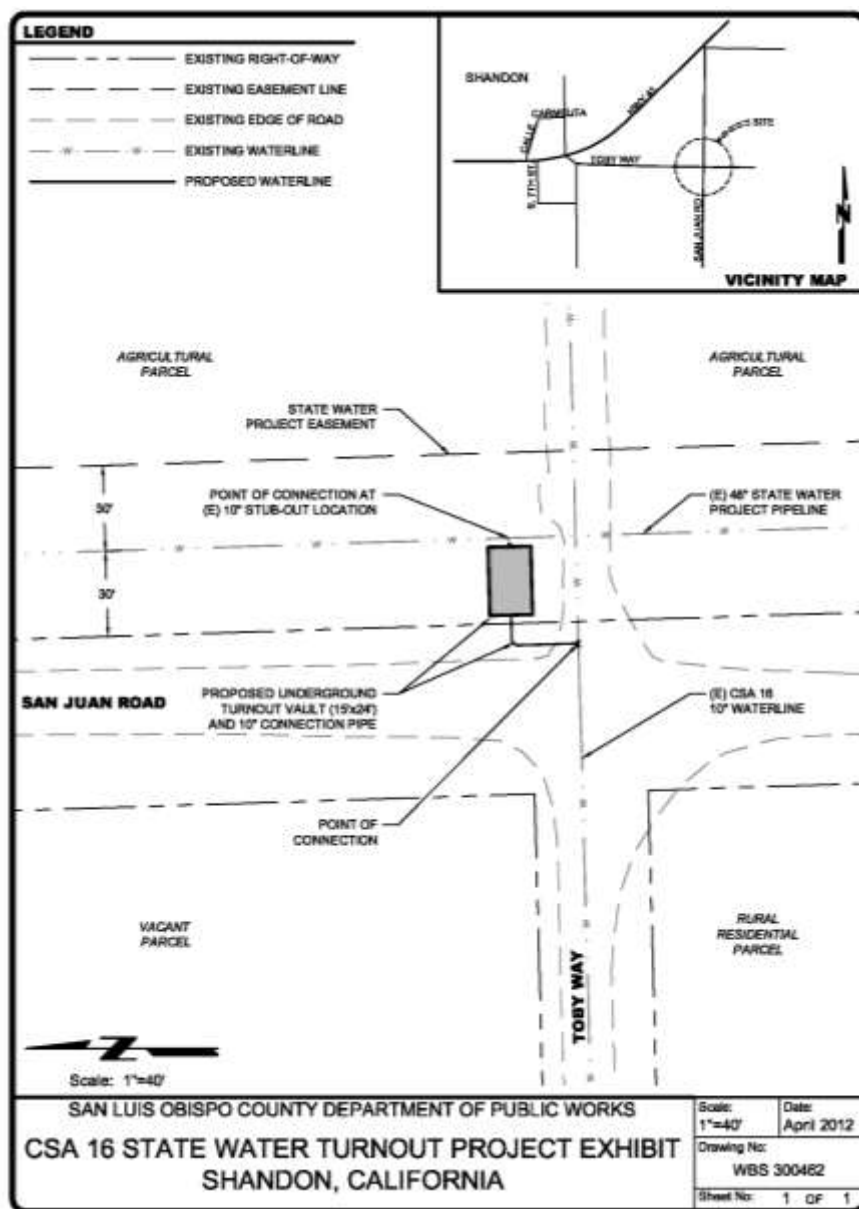


Figure 2-10. *Shandon State Water Turnout Project Map*

The project is currently being designed. Design is anticipated to be complete in June 2013. Once design is complete, the project will be ready to advertise for construction bids and then construct.

The connection will entail the construction of a turnout vault located adjacent to the State Water Pipeline on the northeast corner of Toby Way at San Juan Road, approximately ¼ mile east of the community of Shandon. The connection will be made at the point where the existing main line between the community and the water storage tank crosses the State Water pipeline. Although the site is currently on the border of a fallow alfalfa field, it is entirely within the existing State Water pipeline easement; no new right-of-way or new easements are required. The total area of construction disturbance would be less than 1 acre.

CSA 16 already has contracts in place to provide for the allocation, treatment and delivery (including method of payment) of State Water through the proposed Shandon State Water Turnout facility. No other facilities or agreements are required for project implementation and delivery of project benefits.

## 4.0 Project Physical Benefits

The Shandon State Water Turnout Project delivers the following physical benefits:

- **Water Supply Benefits:** Delivers 100 AFY of critical water supply.
- **Reduced Energy Benefits:** Replaces energy inefficient groundwater pumps with an energy efficient water delivery system; reduces annual energy consumption by 60,000 Kwh.
- **Water Reliability Benefits:** Eliminates the need to pump from the overdrafted Paso Robles Groundwater Basin where Shandon relies on subordinate water rights.

The primary physical benefit of the Shandon State Water Turnout Project is production of 100 AFY of new potable water supply to the community of Shandon, CSA 16. A new water supply will off-set an equivalent amount of groundwater pumping from the Paso Robles Groundwater Basin, which is currently the only supply available to the community.

Additionally, the Shandon State Water Turnout Project will reduce energy use that is currently consumed by Shandon's two well pumps. It is estimated that CSA 16's energy usage would be reduced by approximately 67 percent, thus, reducing greenhouse gases. This energy savings estimate is based on the percentage reduction of groundwater pumping for CSA 16. From July 2005 to July 2012, CSA 16's average yearly water demand, comprised entirely of pumped groundwater, was 149 acre-feet. Over this same period, CSA 16's two well pumps consumed an average annual 90,000 Kilowatt-hours (Kwh) of energy. Taking 100 AFY of State Water would reduce groundwater pumping to an average 49 AFY, a 67 percent reduction. It is estimated that CSA 16 will experience a directly proportional reduction of energy consumption for groundwater pumping, resulting in an approximate average annual energy usage of approximately 30,000 Kwh. The amount of energy saved each year would be dependent on the water demand for that year.

The project will also provide water supply reliability benefits that cannot easily be quantified. However, by ceasing to rely on the overdraft Paso Basin, expected reliability benefits include:

- Water supply reliability during drought
- Water supply reliability if wells are intentionally or unintentionally contaminated
- Water supply reliability to account for climate changes
- Water quality reliability if groundwater quality changes
- Reduced risk of competing water rights

There is a high level of certainty that the water supply and energy benefits will be achieved (see **Table 2-23** and **Table 2-24**). The State Water project's facilities provide for continuous, uninterrupted treated water deliveries to CSA 16's water system. SLO District's 25,000 AFY of State Water allocation is largely unused, making Shandon's allocation reliable even in years when only a portion of State Water allocations is made available. Additionally, the new state of the art equipment is reliably more energy efficient than the old, inefficient groundwater pumps.

The water supply benefits will be monitored by an existing program led by the Central Coast Water Authority (CCWA). CCWA is responsible for operation and maintenance of the Coastal Branch of the State Water Project, in which the Shandon State Water Turnout is located. CCWA's responsibility includes continuous monitoring of the meter that will measure flows delivered to Shandon through the turnout facility. CCWA totalizes the flows once per month and uses the information to produce a monthly and annual report of water quantities delivered. These reports will be used to measure and verify that the project's benefits are being achieved.

The energy savings will be measured by creating a baseline of energy usage over the past ten years and comparing it with annual energy usage after project implementation.

## **4.1 Measurement of Benefits**

Water Supply benefits will be measured using standard flow measuring devices with real-time telemetry. Water Reliability Benefits will be monitored through groundwater elevations at nearby dedicated monitoring wells, with any long-term average increase in groundwater elevations being associated with increased drought year storage. Reduced Energy Benefits will be calculated from energy metering of existing groundwater wells.

## **4.2 Without Project Conditions**

Without the Shandon State Water Turnout Project, Shandon would continue to rely solely on the Paso Robles Groundwater Basin for its water supply, continuing to add to the existing demands and stresses on the basin and contributing to declining groundwater levels. Without the project, Shandon's water supply reliability also remains at risk due to potential negative impacts resulting from drought, water quality declines, intentional or unintentional contamination and competing water rights.



The primary water supply and energy benefits for with and without project conditions are presented in the tables below.

**Table 2-23. Forecasted Annual CSA 16 Project Physical Benefits – Average Annual Water Demand**

Shandon State Water Turnout Project			
<b>Benefit Claimed:</b> Water supply			
<b>Measure of Benefit:</b> acre-feet per year			
<b>Additional Information:</b> Average annual CSA 16 water demand is 156 acre-feet			
Year	Physical Benefits		
	Without Project	With Project	Change Resulting from Project
2013	0	0	0
2014	0	75	75
2015	0	100	100
2016	0	100	100
Annually until 2089	0	100	100
Comments:			
<ul style="list-style-type: none"> <li>Based on 75 year project life</li> <li>Only partial water deliveries in 2014 due to construction completion in the first part of 2014</li> </ul>			

**Table 2-24. Forecasted Annual CSA 16 Project Physical Benefits – Average Annual Energy Consumption**

Shandon State Water Turnout Project			
<b>Benefit Claimed:</b> Energy Savings			
<b>Measure of Benefit:</b> Kilowatt-hours per year			
<b>Additional Information:</b> Average annual CSA 16 energy consumption is 90,000 Kwh			
Year	Physical Benefits		
	Without Project	With Project	Change Resulting from Project
2013	90,000	90,000	0
2014	90,000	45,000	45,000
2015	90,000	30,000	60,000
2016	90,000	30,000	60,000
Annually until 2089	90,000	30,000	60,000
Comments:			
<ul style="list-style-type: none"> <li>Comments Based on 75 year project life</li> <li>Only partial water deliveries in 2014 due to construction completion in the first part of 2014</li> </ul>			

## **4.0 Potential Adverse Physical Effects**

CSA 16's connection to the State Water Project was evaluated in the March 1992 Final EIR for the State Water Project Coastal Branch Phase II Local Lines and Facilities (1992 FEIR). The proposed amount of water was originally 233 acre-feet; however, CSA 16 ultimately contracted for 100 acre-feet. The 1992 FEIR identified significant impacts related to geology and soils; that is, seismic effects on the pipeline and corrosive soils impacts on the pipe materials. Both of these impacts were considered mitigable through standard engineering design.

The 1992 FEIR also identified potentially significant, and not fully mitigable, impacts to schools as a result of growth stemming from the provision of an excess supply of water. This impact, however, no longer applies since the community has already experienced the level of growth discussed in the 1992 FEIR and the amount of State Water actually contracted (100 acre-feet versus 233 acre-feet) has been significantly reduced. Thus, the project will not result in an excess supply. Also, any new growth that does occur in the area would be governed by the Shandon Community Plan<sup>30</sup> which was adopted by the County Board of Supervisors on April 3, 2012.

### **4.1 Project Contacts**

County of San Luis Obispo  
Tom Trott, P.E., Senior Engineer  
County Govt. Ctr., Rm. 207, San Luis Obispo, CA 93408  
(805) 781-1186

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<sup>30</sup>County of San Luis Obispo. "Shandon Community Plan." 2012.

## **Project 5. San Miguel Critical Water System Improvements**

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### **5.0 Project Need**

The small unincorporated community of San Miguel is one of 6 urban areas within the County of San Luis Obispo Salinas River Water Planning Area (WPA 14). Seen as a gateway community to the San Luis Obispo County Region (Region) and the recreational resources of Nacimiento and San Antonio Lakes, this visitor-serving community has the potential to grow but only with assistance of outside influence. The potential growth that may occur could come from any future expansion of activities at Camp Roberts. This growth could lead to a population increase in San Miguel and also stimulate the local economy. Existing high unemployment and lower income levels of a large number of residents make it difficult to implement costly community improvement programs without outside assistance and the establishment of strong community action groups.

San Miguel grew from the founded Mission San Miguel Arcangel in 1797 to a small community in 2010 of 698 households over a 1,705 square mile area. With a 2000 census population of 1,427, San Miguel experienced an annual average 6.4% growth rate to achieve a 2010 population of 2,336. Governance for the small community comes from the San Miguel Community Services District (SMCSD) started by Gregory B. Campbell, a local resident.

The SMCSD (see **Figure 2-11** for boundary) is responsible for water, wastewater, fire protection, and street lighting to the community of San Miguel. The majority of the District's residents are low-income households, as shown in **Figure 2-12**, meeting the criteria for federal funding (CDBG, USDA, and others) as a Disadvantaged Community (DAC) by having incomes of \$42,176, well below the State's DAC threshold of \$48,706.

#### **5.0.1 2002 Water Master Plan**

In 2002, the SMCSD prepared a water master plan<sup>31</sup> whereby various water system needs, improvements and upgrades were identified (see **Figure 2-13** for needed water distribution system upgrades). The various water system needs were prioritized by short-term and long-term needs;

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<sup>31</sup> John L. Wallace and Associates. "Water Master Plan for San Miguel Community Services District." 2002.

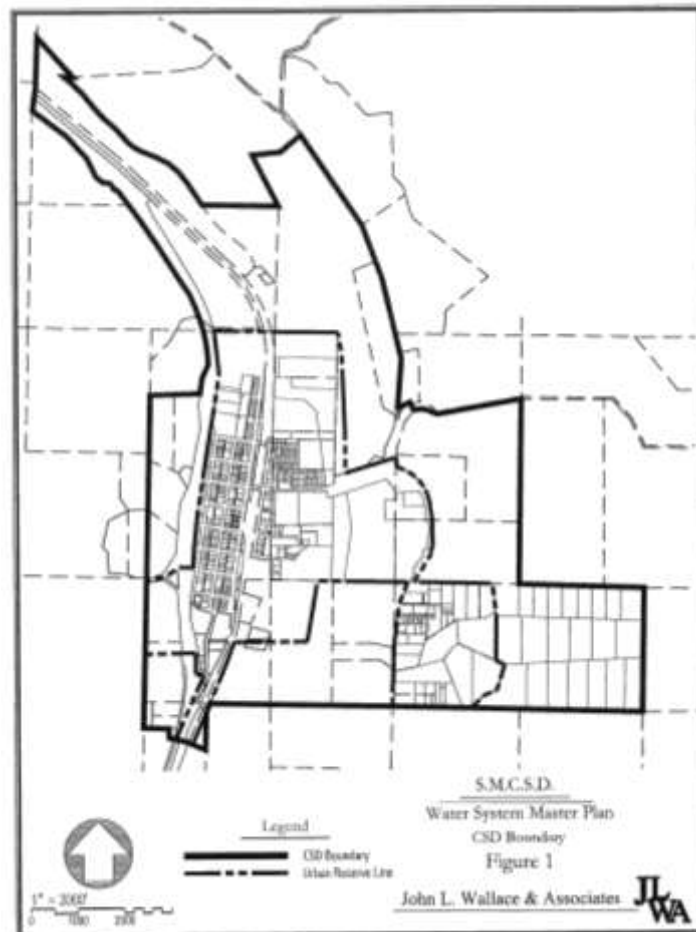


Figure 2-11. *San Miguel Community Services District Location Map*<sup>31</sup>

short-term needs were those projects of highest priority to address deficiencies in water supply, delivery pressure, fire flow capability, water quality, all centering around immediate needs to address health and safety, and reliability of the community's critical water supply and delivery system.

Since that time, due to the limited resources available to the District, very few of the recommended capital improvements could be implemented. Thus, over the past decade, many much needed water system improvements have been deferred, and, as a result, new critical water system needs have arisen. The highest priority project identified in 2002 was the need for water

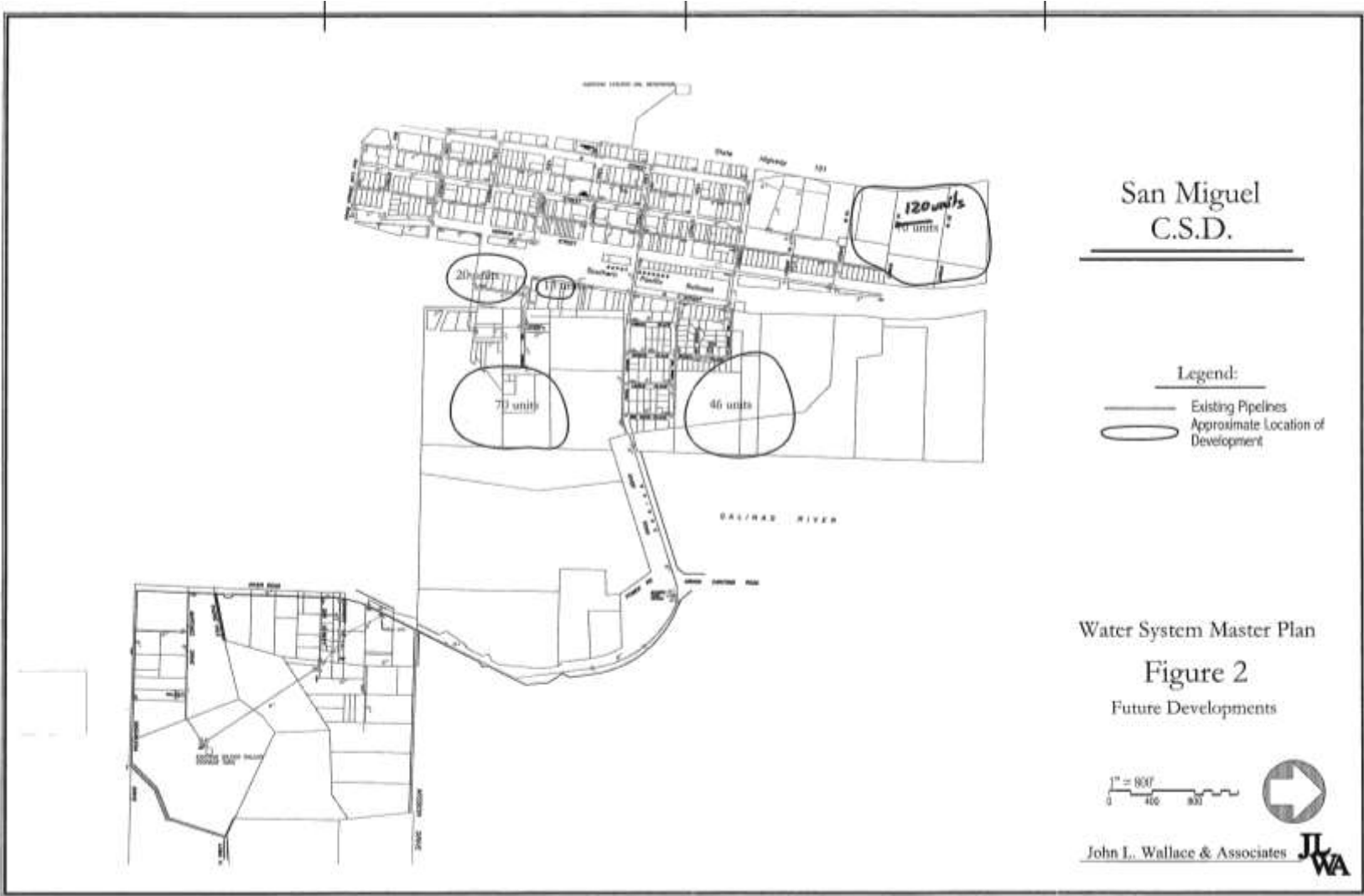


Figure 2-12. *San Miguel 2002 Water System Customers*<sup>31</sup>

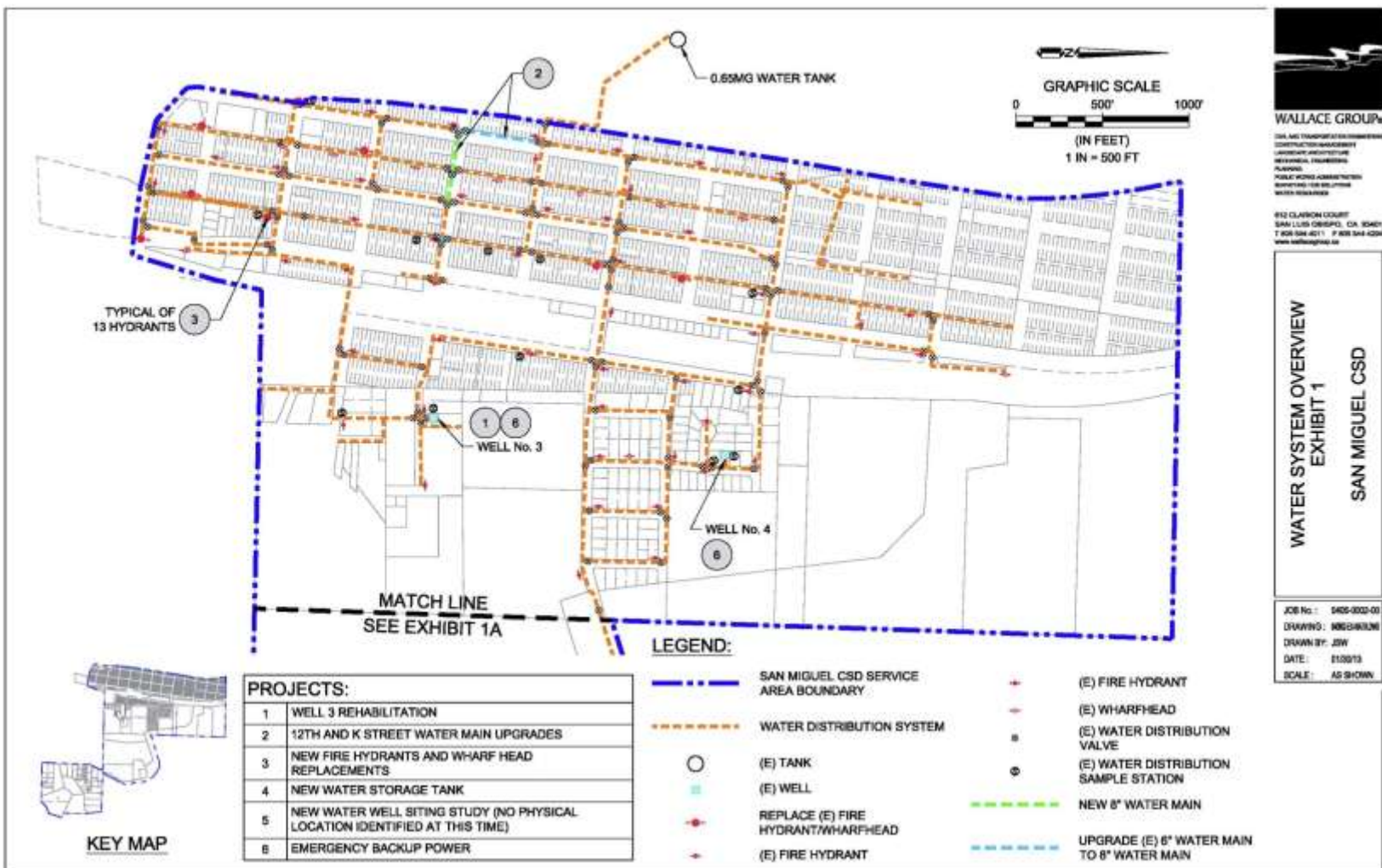


Figure 2-13. *San Miguel Water Distribution System Schematic and Needed Improvements*<sup>31</sup>

storage for fire-fighting capability, as the District's water storage at that time fell very short of necessary reservoir storage to adequately fight fires in the community. This water tank project, a 0.65 million gallon steel water storage tank, and associated water transmission main, was completed in 2010 with the assistance of USDA Rural Utilities grant and low interest loan funding. Even with 45% grant funding received, the District had to take on debt service to fund the other 55% of this critical project. In addition, the water storage constructed in 2010 was still not sufficient to meet all of the community's needs, although the new tank brought much relief to the community.

## 5.0 Project Development and Selection

As mentioned above, in 2002, the SMCS D prepared a water master plan to investigate, quantify, and address known water system deficiencies. Since 2002, there has been little in the way of updating this plan since unfunded projects were not feasible for the DAC unless outside support became available. An update to the project definitions, costs, and benefits analysis has been done as a part of this project implementation grant submittal with most of its findings documented herein.

San Miguel overlies the northern portion of the Estrella Subarea of the Paso Robles Groundwater Basin and receives 100% of its water from groundwater supplies through three municipal wells. A groundwater basin characterization study was completed in 2010 and is included in the San Luis Obispo County Master Water Report. In addition, the Paso Robles Groundwater Management Plan<sup>26</sup> for the entire basin was completed in 2011 (GEI, February 2011). These studies describe the groundwater aquifer underlying the SMCS D, in the northern portion of the Estrella Subarea basin, as being healthy and with a water quality that is generally good and treatable as a source of drinking water supply. This is confirmed in the groundwater hydrograph (**Figure 2-14**) where, in wet to below average years, groundwater elevations recover each year.

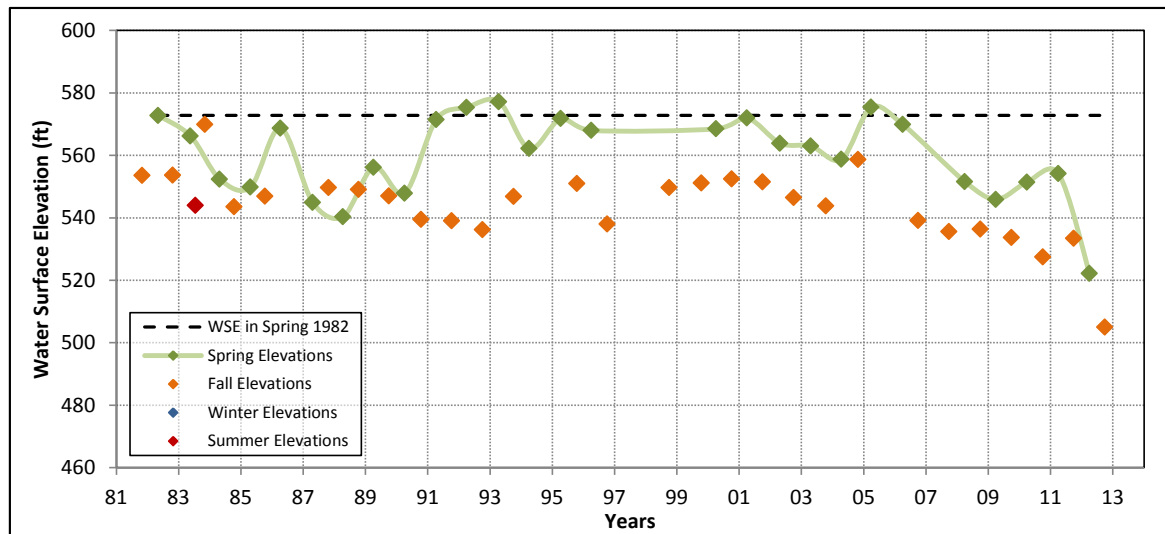


Figure 2-14. *San Lawrence Terrace Well (25S/12E-21G01) Hydrograph*



The steady decline after 2005 indicates a period of extended dry years from 2001 to 2013 and the influence of increased pumping in the overall Paso Robles Groundwater Basin. The same condition is not true for other communities in the Estrella Subarea, as discussed in the Regional Description (see Section RD.2 for discussion of Paso Robles Groundwater Basin).

## **5.0 Project Description**

This grant application is seeking funding for six of the highest priority, critical water supply projects as listed below. SMCSD needs to implement all six of these identified projects in the immediate future, or they will be faced with continued deterioration of an already deficient, critical water system, and may not be able to support even limited beneficial growth with the identified deficiencies that face the District's water system.

4. New Fire Hydrants and Wharf Head Replacements – Thirteen (13) new fire hydrants to replace inadequate and aging hydrants.
5. Well 3 Rehabilitation - Well 3 is over 40 years old and requires upgrades in the well motor housing, disinfection system, electrical wiring, backup power generation and the protective structural building.
6. New Water Well Siting Study – Respond to the urgent need of replacing the San Lawrence Terrace Well, taken out of service because of high arsenic concentrations, and providing water supply redundancy in the event of an emergency shutdown of any three existing wells.
7. Emergency Backup Power – Equip Well 3 and Well 4 with power generators in the event of power failures to maintain a minimum supply of water during widespread power outages.
8. New Water Storage Tank – Construct the San Lawrence Terrace Water Storage Tank with 0.25 million gallons for capacity and water quality improvements
9. 12th and K Street Water Main Upgrades – Replace old and undersized piping at 12th Street and K Street.

To finance existing system improvements, SMCSD recently increased rates to pay the debt service for the 0.65 million gallon tank and begin a sinking fund for replacement/rehabilitation of the aging water system. This was the SMCSD's first water and sewer rate increases in over a decade. Being a DAC, this was extremely hard on the majority of the community's residents.

## **5.1 Project Physical Benefits**

The six projects together will ensure the SMCSD's existing immediate and critical water system deficiencies are addressed. The benefits will include immediate improvement in fire-fighting capability by replacing inadequate fire hydrants, ensuring existing water supply reliability by siting a new well location of suitable groundwater quantity and quality and by upgrading existing water supply well facilities at Well 3 (pumping capacity, disinfection, electrical controls housed in a deteriorated building), providing emergency backup power for two wells, adding the additional fire storage needed (0.25 million gallons) for the existing community (the recent 0.65

million gallon USDA water tank project met only a portion of the needed storage to meet existing needs), and improving deficient water distribution piping currently being experienced in the community to ensure adequate service pressure and fire flows (Exhibit D).

Quantified benefits focus on addressing the health and safety deficiencies in the SMCSD's existing water supply system and are estimated as follows:

- **Critical Water Supply Benefits:** SMCSD is responsible for providing critical water supplies to the financially challenged Disadvantaged Community of San Miguel. Current-day water demands are 275 AF/year, and maximum day water demand is approximately twice that, or 550 AF/year. Collectively, the projects included in the Critical Water System Improvements will upgrade the water system to a minimum level of performance, including certification of Title 22 water treatment, required by CDPH.
- **Reduced Energy Benefits:** Replaces energy inefficiencies in Well 3's groundwater motor and electrical components with current-day energy efficient equipment. The new well siting will ultimately lead to the construction of a new primary well using the same energy efficient equipment.
- **Critical Water System Reliability Benefits:** Greatly reduces concerns with the possibility of losing additional wells, operating during emergency conditions, and the inability to operate storage facilities to meet fire code<sup>32</sup> requirements.

The primary net physical benefit of the collection of projects is the production and distribution of sufficient water supplies to meet the 275 AF/year water demand and instantaneous 3,500 gpm fire flow requirements. The expected physical benefits will be achieved through the following actions:

### ***5.1.1 New Protective Structure – Water System Reliability***

From photos shown in **Figure 2-15**, the existing Well 3 site is inadequate and unsafe to house existing well electrical and chemical feed equipment. The existing well building is essentially a “shack” that is not weatherproof or water-tight. The photos below show the openings between ceiling and walls, and a typical amount of water entering the building following a rain event. These conditions have and will continue to be detrimental to the security, safety, and electrical equipment at the site.

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<sup>32</sup> The California Fire Code (CFC 903.2, 903.4.2), the adopted fire code for San Luis Obispo County (Title 16.10).



Figure 2-15. *Well 3 Housing Structure Photos*

### ***5.0.1 Upgrades to Well 3 – Water Supply Reliability, Water System Reliability, Reduced Energy***

Well 3 upgrades will bring 40 year technology and energy efficiencies to modern day standards of improved electrical equipment, pump design and control valve operations. Along with the standby generator project, Well 3 will have the highest reliability of water supply in the system and the lowest per gallon operations cost due to these proposed rehabilitation efforts.

### ***5.0.2 Siting of New Well – Water Supply Reliability, Water System Reliability***

In addition to their aged condition, radionuclides in water supply Well 3 and Well 4 have been increasing in concentrations over the years. The appendices to the 2002 Water Master Plan portray the historic radionuclide information for Wells 3 and 4, shown below in **Figure 2-17**. Clear trends of increasing radionuclide concentrations are evident. Since this “trending” analysis was completed in 2002, there have continued to be periodic isolated exceedences for this primary MCL. A new water supply well, with screened casing in a different aquifer zone, will allow the SMCS D to yield a new water supply which reliably meets all drinking water standards. The new well siting study will help pinpoint the best location, and optimum screened interval to accomplish the addition of a new safe and reliable water supply for the community.

### ***5.0.3 Replace Fire Hydrants – Water Supply Reliability, Water System Reliability***

SMCSD has identified a total of 13 old and aging fire hydrants and undersized wharfhead hydrants. The old aging fire hydrants are considered by operations staff<sup>33</sup> to be unreliable any longer, for yielding fire flows during emergencies. This poses a serious safety threat during fire emergencies. The photograph (in Figure 5-6) provide an example of the condition of the hydrants in poor condition. Also, the existing wharfhead hydrants are 2” diameter, and substantially below standard (6” standard hydrant) for delivering adequate fire flows. A photograph of the existing wharfhead hydrants to be replaced is shown in in Figure 5-6.



Figure 2-16. *Photo of Aging Fire Hydrant (left) and Wharfhead (right)*

### ***5.0.1 New Well Siting Study – Water Supply Reliability, Water System Reliability and Reduced Energy***

In April 2003, the SMCSD retained the services of a local hydrogeologist to conduct a preliminary well siting study for installation of new municipal water wells. The report<sup>34</sup> identified two potential sites as shown on **Figure 2-18**; north of the Mission San Miguel in the southern portion of the town, and north of Lillian Larson School in the northern portion of the town. In 2010, the SMCSD pursued a USDA grant/loan (similar to that implemented for the new water tank construction) to complete the necessary site investigations, but found that USDA no longer had any grant monies available. The project had since been postponed due to lack of funding. The SMCSD

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<sup>33</sup> Mr. Kelly Dodds, Utilities Supervisor SMCSD

<sup>34</sup> Boyle Engineering. “San Simeon CSD Water System Master Plan and Wastewater Collection System Evaluation.” 2007.

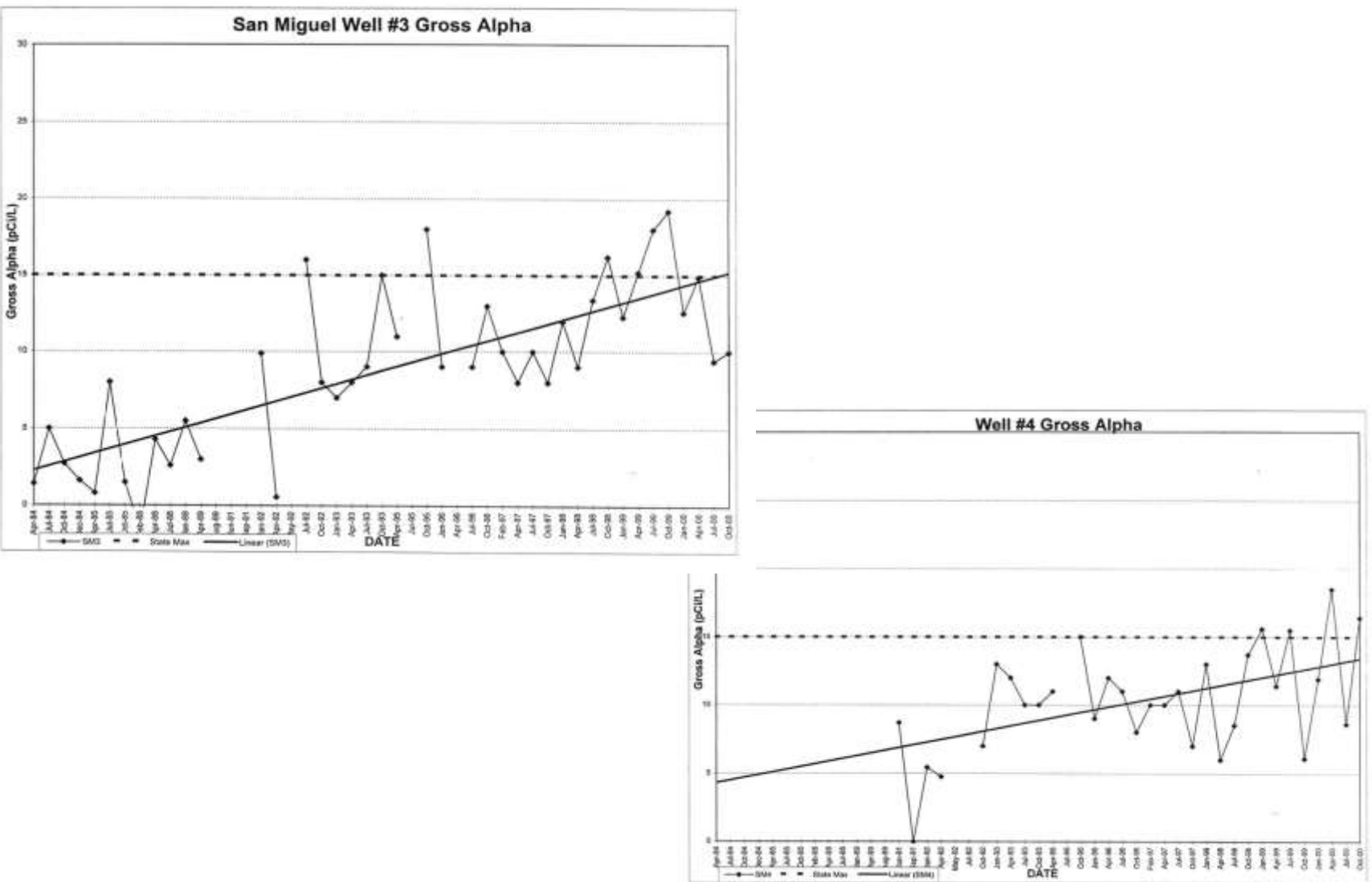


Figure 2-17. *Radionuclide Trend Analysis in Well 3 and Well 4*

must continue to pursue the installation of at least one new water supply well in order to secure water supply reliability for today's water demands and to ultimately supplement inefficient 40 year old wells with a new energy efficient well. This new well siting study would essentially build upon the prior study completed in 2003, and will include a more detailed analysis of the two identified well sites including property acquisition, pilot hole drilling, logging of the pilot holes, and water quality testing to verify the quality of groundwater in these two areas.

#### ***5.0.1 Power Generators for Wells–Water Supply Reliability, Water System Reliability***

The SMCSO will utilize two new standby generators at their two existing well sites, Wells 3 and 4. Refer to **Figure 2-13** for the locations of both well sites. The standby generators will be used during times of extended power outages, and major emergencies such as earthquakes, to ensure the SMCSO can continue pumping groundwater needed for domestic supply and most importantly, for needed fire flow.

#### ***5.0.2 Water Distribution System Improvements – Water System Reliability***

The SMCSO is pursuing to complete an upgrade to existing water piping in the southern area of San Miguel to correct deficient fire flows to the southern San Miguel area including the Mission, a critical tourist attraction to the community. It is also noted that new CDPH standards require new water mains to be a minimum of 8" diameter. The "before and after" hydraulic model results of the above described CIPs showing deficient fire flows "before and after" the CIP upgrades, are shown in the tables (included as **Figure 2-19**) below.

### **5.1 Quantification of Physical Benefits**

Physical benefits realized from each of the sub-projects are quantified based on the intended purpose for each. In all cases, there is a physical benefit in upgrading the existing water system to meet regulatory water system standards from the DPHS, and from the local fire district. For replacement of fire hydrants, the physical benefit will be an increase in the number of operational fire hydrants in the water system. For the standby generators, the physical benefit becomes a percentage of water supplies that will be made available during emergency conditions. For water storage, the physical benefit is measured as the required system performance in the design and construction of a water distribution using standard engineering practices. **Table 2-25** summarizes the change in physical benefits to the Water System for each project.

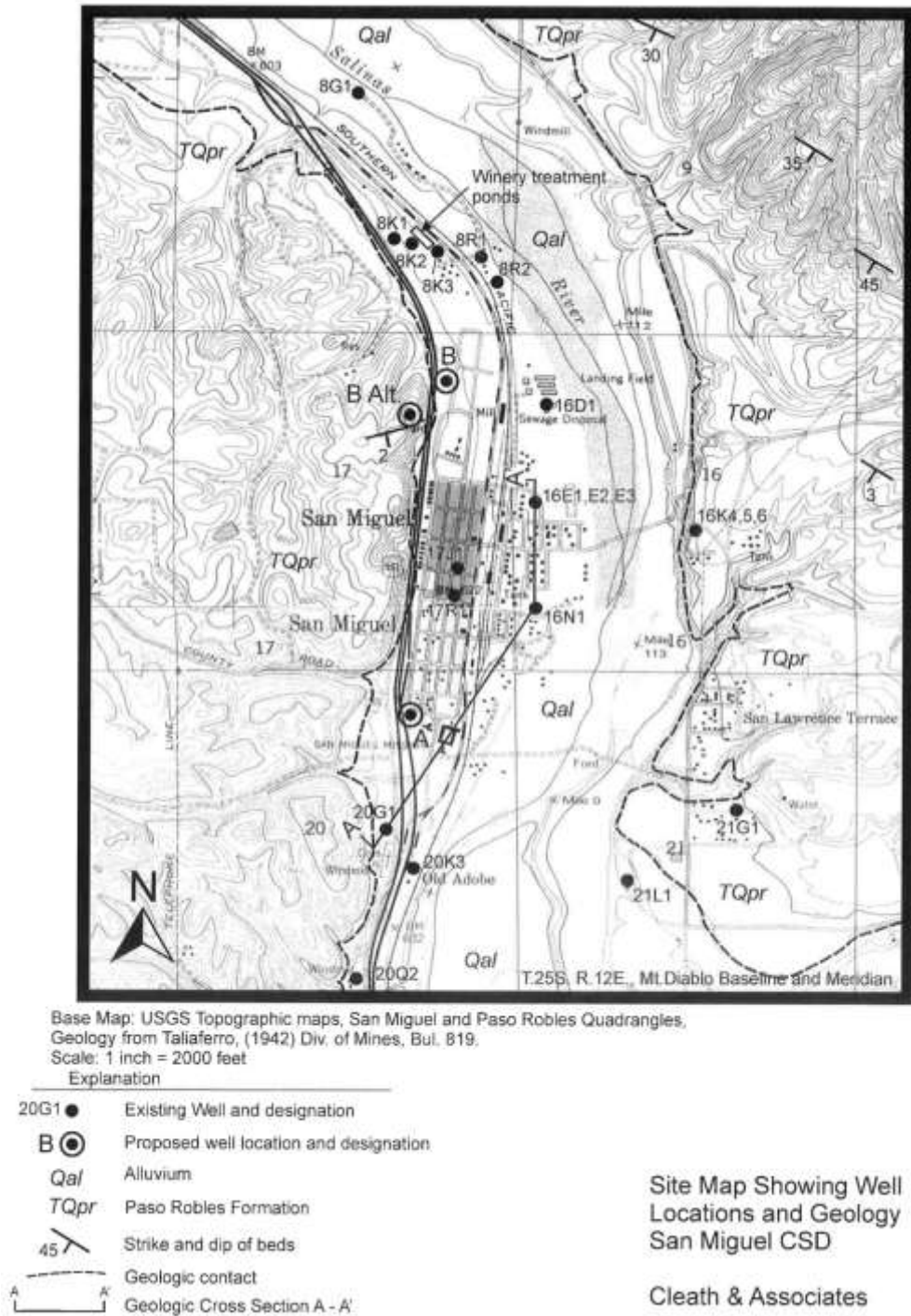


Figure 2-18. 2003 Well Siting Study Showing Two Candidate Sites



Average Day Demand Tank Full					
Junction	Pressure (PSI)		Pipe	Velocity (fps)	
	Existing	Future		Existing	Future
J-65	67	67	P-107	0.16	0.01
J-66	54	55	P-108	0.07	0.14
J-69	54	55	P-251	0.31	0.37
J-70	65	65	P-130	0.51	0.37
J-71	66	67	P-133	0.06	0.00
J-124	55	56	P-254	0.14	0.09

Peak Hour Demand Tank Full					
Junction	(PSI)		Pipe	(fps)	
	Existing	Future		Existing	Future
J-65	59	67	P-107	0.55	0.05
J-66	47	55	P-108	0.26	0.48
J-69	46	54	P-251	1.07	1.31
J-70	57	65	P-130	1.79	1.30
J-71	59	67	P-133	0.22	0.01
J-124	48	56	P-254	0.49	0.30

Maximum Day Demand Plus 1,500 gpm Fire Flow @J-70 Tank 1/2 Full					
Junction	(PSI)		Pipe	(fps)	
	Existing	Future		Existing	Future
J-65	-6	63	P-107	4.85	3.02
J-66	-15	52	P-108	5.12	5.60
J-69	-22	47	P-251	4.83	5.32
J-70	-12	58	P-130	5.92	4.14
J-71	-8	62	P-133	2.48	2.16
J-124	-16	52	P-254	2.38	1.93

Maximum Day Demand Tank 1/2 Full					
Junction	Pressure (PSI)		Pipe	Velocity (fps)	
	Existing	Future		Existing	Future
J-65	63	66	P-107	0.31	0.03
J-66	50	53	P-108	0.15	0.28
J-69	50	53	P-251	0.61	0.75
J-70	61	63	P-130	1.02	0.74
J-71	62	65	P-133	0.13	0.01
J-124	52	54	P-254	0.28	0.17

Maximum Day Demand Plus 1,500 gpm Fire Flow @J-71 Tank 1/2 Full					
Junction	(PSI)		Pipe	(fps)	
	Existing	Future		Existing	Future
J-65	-6	63	P-107	5.33	3.35
J-66	-15	52	P-108	2.31	1.03
J-69	-21	49	P-251	4.26	5.15
J-70	-10	60	P-130	6.11	4.29
J-71	-9	62	P-133	1.89	0.94
J-124	-16	52	P-254	1.93	1.93

Maximum Day Demand Plus 2,500 gpm Fire Flow @J-112 Tank 1/2 Full					
Junction	(PSI)		Pipe	(fps)	
	Existing	Future		Existing	Future
J-65	-95	60	P-107	7.59	4.76
J-66	-99	52	P-108	6.69	7.51
J-69	-116	41	P-251	7.43	8.29
J-70	-105	52	P-130	9.30	6.43
J-71	-100	57	P-133	1.70	0.93
J-124	-104	50	P-254	4.35	3.06

Figure 2-19. *Benefits from Pipeline Improvements to Existing Distribution System*

**Table 2-25. San Miguel CSD Quantified Physical Benefits by Project Element**

San Miguel Critical Water System Improvements										
Benefit Claimed: Water system										
Measure of Benefit: acre-feet per year										
SMCSD Project ID	Quantified Benefits									
Benefits to:	Benefit Description	Unit of Meas.	Before	Well Rehab	Main Upgrades	Fire Hydrants	Storage Tank	Well Siting	Power Generators	Overall Difference
1. Meeting Minimum Water Supply System Requirements	Gaining DPHS Approval of System Adequacy to meet 275 AF/year average annual water demand	AF/year	Below standard system with marginal ability to provide 275 AF/year	Increase supply reliability	Meeting minimum pressure standards	Meeting fire codes	Meeting peak-hour and fire flow requirements	Next phase of adding a new water supply well	Standby power in case of emergencies	Meeting DPHS standards to deliver 275 AF/year
2. Water Distribution System	Peak Hour System Flows and Pressures	gpm and psi	“negative” fire flow pressures and substandard water system performance		Residual fire flow pressures of 40 psi and greater during fire flows					Meeting Fire Code requirements with Fire District and system design with DPHS standards
3. Fire Hydrant	Fire Hydrant Replacement	count	Old unreliable hydrants; undersized wharfhead hydrants			Replace 13 hydrants with new 6” standard hydrants				Increases safety/reliability of system hydrants, provides new hydrants where only undersized wharfhead hydrants exist, meeting both Fire District and DPHS standards

**Table 2-25. San Miguel CSD Quantified Physical Benefits by Project Element, Continued**

San Miguel Critical Water System Improvements										
Benefit Claimed: Water system										
Measure of Benefit: acre-feet per year										
SMCSD Project ID			Quantified Benefits							
Benefits to:	Benefit Description	Unit of Meas.	Before	Well Rehab	Main Upgrades	Fire Hydrants	Storage Tank	Well Siting	Power Generators	Overall Difference
4. Peaking and Emergency Storage	Storage Volume	Gallons	700,000 gallons				250,000 Gallons of New Storage			950,000 gallons of storage for commercial/industrial fire flows in community
5. Water Quality	Radionuclides	Unit of Measure	10 to 15 pC/L, approaching Primary MCL of 15 pC/L					New Well to Provide Water Quality Meeting Primary MCL		New water well that meets all primary drinking water standards to at or below the MCL of 15 pC/L
6. Redundancy in Supply Facilities	Minimum well sites with largest off-line	CDPH Requirements	Community relies on a single well for water insufficient water supply to meet maximum day event of 300 gpm	Improved Reliability of Existing Wells				New Well affords more supply redundancy	Providing emergency power better assures well operation during power outages	Improved water supply reliability in meeting maximum day water demands of 340 gpm

## Project 5. San Miguel Community Services District Critical Water System Improvements

Over the period of the next 5 years, the project will shore-up a 40 year old system in need of immediate rehabilitation and replacement. The water system's reliability in extreme water demand periods and over changing hydrologic periods will be an important element of providing a safe and reliable drinking water supply. A measurement of water supply reliability (**Table 2-26**) is seen by the amount of production capacity allowing for the largest well out of service. Water system hydraulic improvements (**Table 2-27**) are measured by the amount of needed storage capacity to meet peak hour and fire flow water demands. Storage and pipeline improvements are both seen by improved water distribution system pressures (not quantified).

**Table 2-26. Forecasted Annual SMCSO Project Physical Benefits – Water Supply Reliability**

San Miguel Critical Water System Improvements			
<b>Type of Benefit Claimed:</b> Annual water supply reliability			
<b>Measure of Benefit:</b> acre-feet per year			
<b>Additional Information:</b> Claimed benefit is tied to meeting existing annual average, maximum day, and peak hour water demands			
	Physical Benefits		
Year	Without Project	With Project	Change Resulting from Project
2013	Inadequate fire flow capability; no water supply redundancy; water quality exceeding primary MCLs; inability to safely and reliably deliver 275 AF/year.	Meet fire flow requirements; improve water system reliability; wholesome water supply meeting primary drinking water standards; safely and reliably deliver 275 AF/year.	Allows current customers to be better protected from fires, have reliable water supply during mechanical problems and natural disasters, healthy wholesome water supply meeting primary drinking water standards
2014	Same as above	Same as above	Same as above
2015	Same as above	Same as above	Same as above
2016	Same as above	Same as above	Same as above
Etc.	Same as above	Same as above	Same as above
Last year	Same as above	Same as above	Same as above
<b>Comments:</b> Improvements also allow District to approve future economic development in the community.			

**Table 2-27. Forecasted Annual SMCSD Project Physical Benefits – Maximum Day and Peak Hour Capacity**

San Miguel Critical Water System Improvements (Well 3 Rehabilitation, Emergency Power, and Siting of New Well)			
Benefit Claimed: Maximum day demand			
Measure of Benefit: gpm			
Additional Information: Accounts for period of meeting fire flows			
Year	Physical Benefits		
	Without Project	With Project	Change Resulting from Project
2013	300	300	0
2014	300	340	40
2015	300	340	40
2016	300	340	40
Last Year	300	340	40

## 5.0 Measurement of Benefits

The water supply benefits will be measured by hourly and daily monitoring of groundwater pumping and storage levels. Field testing of fire hydrants and flows will take place annually with both reported annually. These reports will be used to measure and verify that the project's benefits are being achieved.

Service records for customer calls and complaints regarding low pressures, poor water quality, and the cost of water will be monitored. The Well 3 energy savings will be measured by creating a baseline of energy usage over the past five years and comparing it with annual energy usage after project implementation.

### 5.1 Without Project Conditions

Without these improvements and with continued growth, the reliability of the critical SMCSD water system becomes exponentially lower and costs to operate and repair the system more expensive due to immediate construction needs from potentially catastrophic failures and reduced energy efficiencies from older equipment. Specific actions resulting from no project may include:

- Emergency Rationing, if a single well goes down
- Insufficient Fire Flow, that can lead to property damage and loss of life
- Health and Safety, drinking water will not be potable for human consumption
- Building Moratorium, stop new growth until safe and affordable water supplies are available
- Higher water rates

## 5.2 Potential Adverse Physical Effects

All critical water system improvements are needed to sustain the existing population in the DAC community of San Miguel. No permanent (non-construction related) adverse effects will occur from the implementation of this project.

**Groundwater** – Rehabilitation of existing well and siting of new well do not pose a risk to the water quality and storage capacity of the groundwater aquifer. There is no planned increase in the annual average extraction volume of groundwater.

**Air Pollution** – Air quality permits will be obtained for operation of emergency generators.

**New Growth** – Water system improvements will benefit existing rate payers only. Any benefit to new growth will be the ability to grow and not have to fix the existing system to provide additional water system capacity.

## 5.3 Project Contacts

Steven G. Tanaka, SMCSO District Engineer  
Wallace Group  
612 Clarion Court  
San Luis Obispo, CA 93401  
(805) 544-4011

Kelly Dodds, Utilities Supervisor, SMCSO  
1150 Mission Street  
San Miguel, CA 93451  
Tate (805) 467-3388

## **Project 6. San Simeon Supplemental Water Supply Feasibility Study and Design Project**

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San Simeon is located along Highway 1 north of Cambria as shown in the **Figure 2-20** aerial photograph. Water and wastewater services are provided by the San Simeon Community Services District (SSCSD). SSCSD currently serves an area of approximately 100 acres with approximately 320 dwelling units and a population of approximately 460 persons. The median household income (MHI) is \$43,092, or 71% of the State MHI and thereby qualified as a State designated Disadvantaged Community. Motel rooms, restaurants, and other tourist facilities are a major component in the SSCSD water and sewer usage. There were 706 existing hotel/motel units (rooms) in the District service area. Tourist populations vary with the seasons. The majority of jobs for local residents are associated with the hotel/motel service industry.

### **6.0 Project Need**

This section provides the historical relationship of the project and its needs as defined by the San Simeon community and their self-imposed actions currently (2013) taking place to ensure a safe drinking water supply and meet fire flow supply requirements.

#### **6.0.1 Historical Conditions**

In 2007, SSCSD prepared the SSCSD Water System Master Plan and Wastewater Collection System Evaluation<sup>34</sup> (SSWWMP) (Boyle Engineering, November 2007). The purpose of the study was to identify system improvements required to meet existing and projected demands, per the San Luis Obispo's Land Use Element of the County General Plan.

The historic demand was obtained from SSCSD water production and billing data from 2000 to 2005. Reliable data was not available prior to 2000. From that data, it was determined that approximately 19 percent of the historic water consumption was attributed to residential uses, 3 percent was attributed to commercial uses, 57 percent was attributed to hotel/motel use, 13 percent was attributed to restaurant uses, and 7 percent was attributed to other uses.<sup>34</sup> In San Simeon, seasonal demands are typically highest in July and August, and lowest in December through February, representative of increased demands during the tourist season.

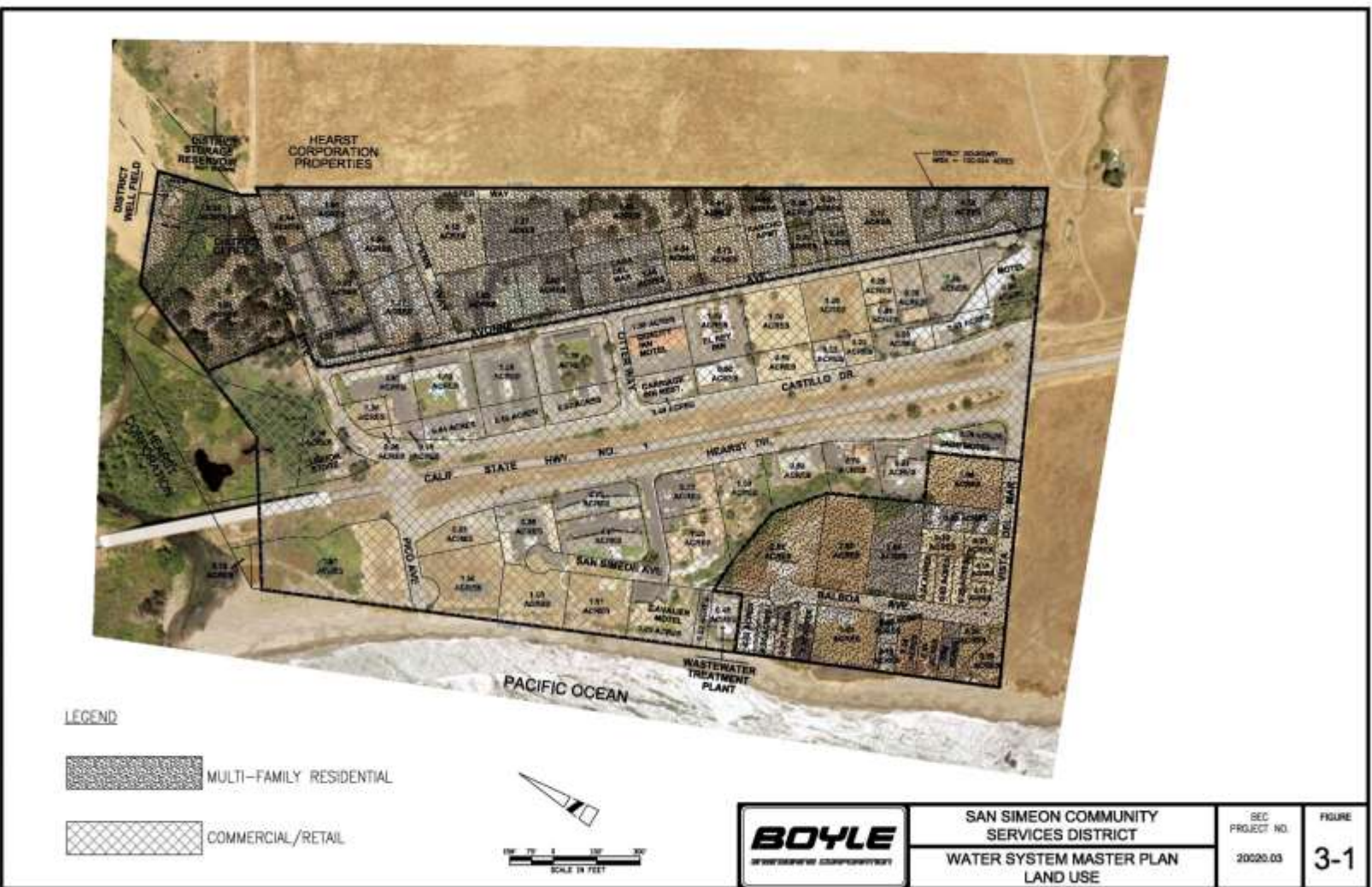


Figure 2-20. *San Simeon Master Plan Land Use Image*<sup>34</sup>



### **6.0.1 San Simeon Water Supplies**

100 percent of the SSCSD water demand is supplied from underflow wells along Pico Creek based on a 140 AFY water right for diversion of Pico Creek.<sup>35</sup> For purposes of this technical justification, the pumped water is considered to be hydraulically connected with the groundwater aquifer and pumping has a direct impact on the aquifer during dry months of the year.

There are two physical actions taking place which jeopardize the quality of water extracted from the two SSCSD wells. Past (1980's) groundwater extractions have exceeded the safe basin yield of the Pico Creek Groundwater Basin, causing a drop in groundwater elevations and leading to saltwater intrusion:

*Seawater intrusion episodes of relatively short duration can be expected during extended gaps between wet seasons, but although groundwater levels fluctuate in response to a combination of both production rates and precipitation, high production rates were the primary cause of lower water levels recorded between 1984 and 1989.*<sup>34</sup>

The creek is also being cut-off from the ocean in the low flow summer months by sand which accumulates as mounds blocking the creek's natural outflow point, allowing water to pond and slowly pass underground through the sand barrier. Wave action over the natural barrier creates another form of saltwater intrusion. SSCSD states:

*What causes the salt water intrusion is when the Well levels are low and ocean tides are high salt water from the ocean passes over a subsurface clay barrier that separates the ocean water from the aquifer water. When groundwater elevations are high enough, the aquifer water level itself provides a saltwater barrier. (R.Lundy, 2013)*<sup>34</sup>

The safe yield from the underlying Pico Creek Groundwater Basin is estimated to be 120 AF/year. Of this amount, Hearst Ranch wells average 16 AF/year, leaving SSCSD 104 AF/year extracted from their two public water supply wells. Further reductions in SSCSD are mandatory in dry months and dry hydrologic periods reducing the available supply to an estimated 90 AFY.

### **6.0.2 Water System Deficiencies**

Groundwater is supplied to the community by the two wells<sup>34</sup>, and storage is provided by a 150,000-gallon reservoir (see **Figure 2-21**). A hydraulic profile schematic of the SSCSD water

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<sup>35</sup> Source is identified as groundwater underflow from surface waters in Pico Creek. Division of Water Rights Amended License for Diversion and the use of Water, (Permit 12465, License 12272) states the maximum amount of water shall not exceed 140 AF/year or 0.27 cubic feet per second instantaneous diversion amount.

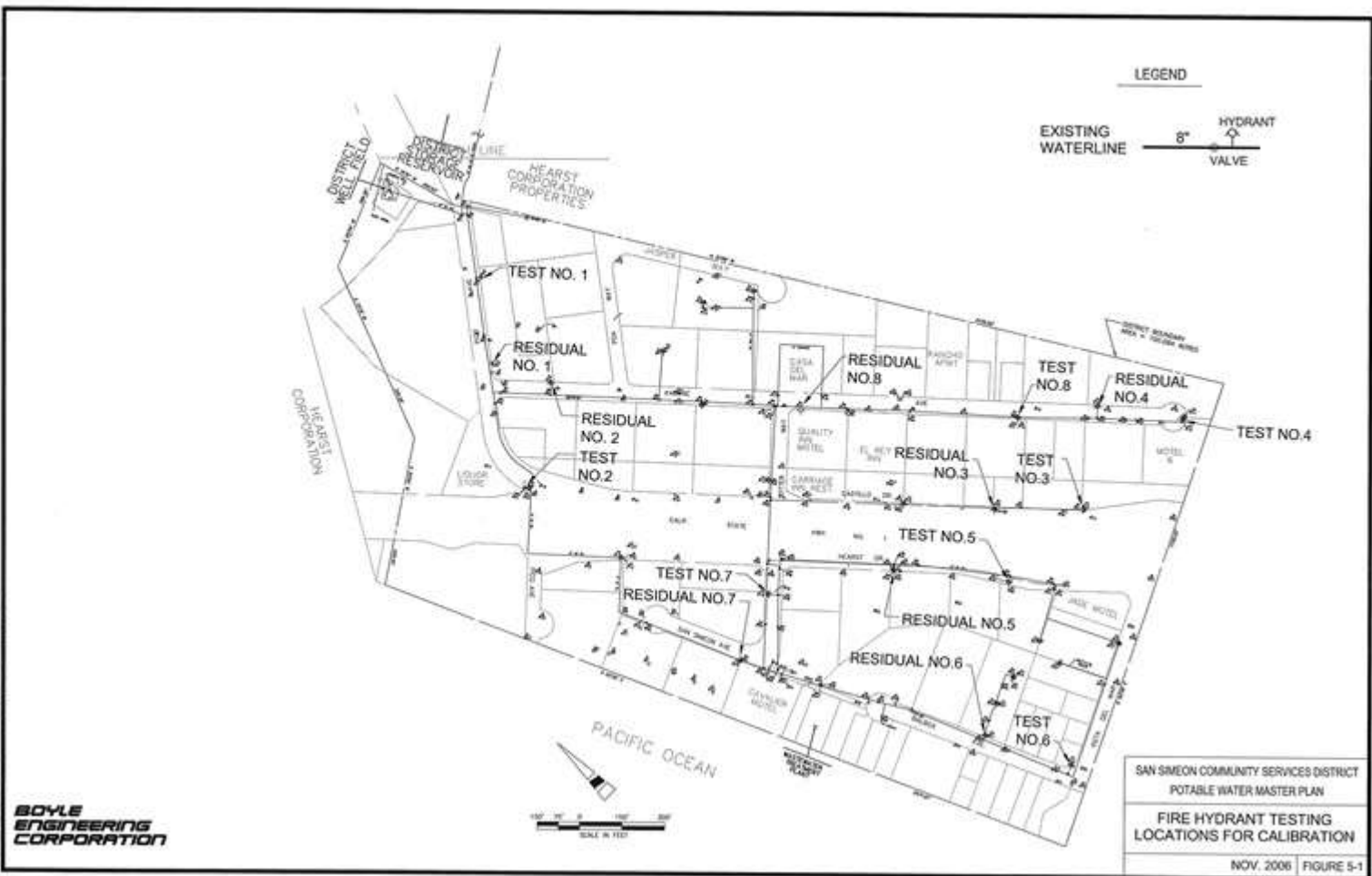


Figure 2-21. *San Simeon Water Distribution System Schematic*<sup>34</sup>

distribution system is shown in **Figure 2-22**.<sup>34</sup> The profile illustrates the pumping of water from wells at belowground groundwater elevations to the higher elevation storage tank and water distribution system. The higher elevation storage tank is needed to meet maximum peak hour flows and instantaneous fire flows. Based on the 2007 SSWWMP water distribution analysis, weaknesses in the hydraulic performance of the system model identified weaknesses of low pressure and volume in portions of their system where insufficient looping in the pipe layout occurs. These same weaknesses lead to insufficient pressure and flow to meet fire department standards during maximum day water demand conditions.

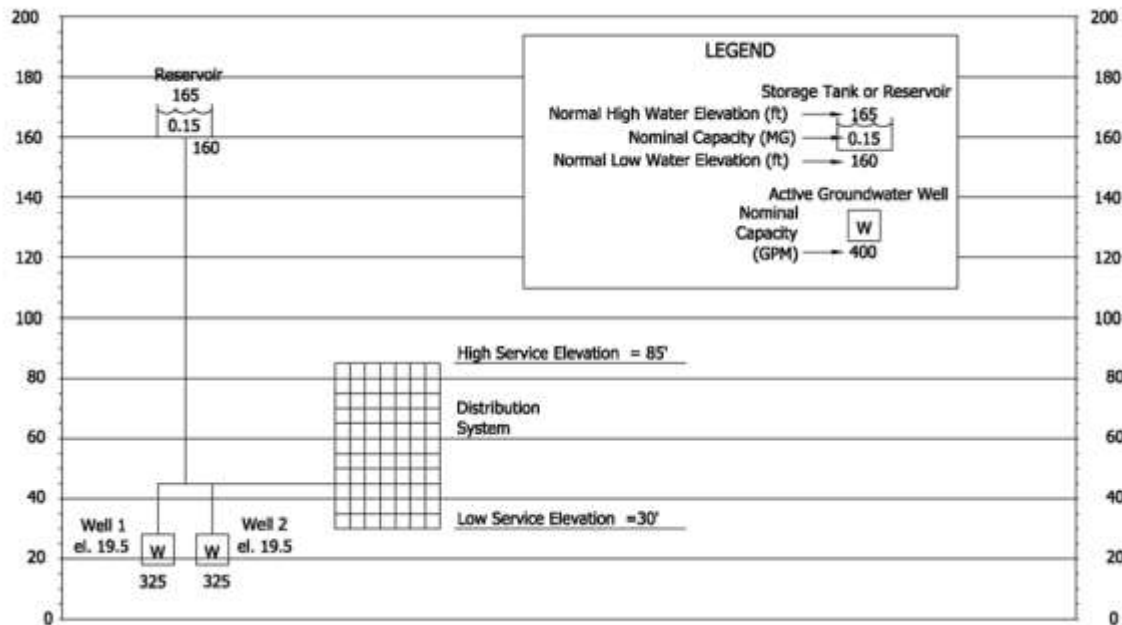


Figure 2-22. *Hydraulic Profile of Existing System*

### **6.0.1 Past SSCSD Measures to Prevent Increases in Salinity Concentrations**

In an effort to reduce groundwater demand and thereby mitigate seawater intrusion and introduction, SSCSD adopted the following strict conservation measures:

- Ordinance 61 Moratorium on Water and Sewer Connections (1/15/86)
- Ordinance 62 Moratorium on Water and Sewer Connections (8/13/86)
- Ordinance 63 Moratorium on Water and Sewer Connections (4/1/87)
- Ordinance 64 Water Conservation (10/10/87)
- Ordinance 66 Moratorium on Water and Sewer Connections (3/9/88)
- Ordinance 69 Amendment of Ordinance 64 Water Conservation (12/21/88)
- Ordinance 70 Amendment of Ordinance 64 Water Conservation (3/8/89)
- Ordinance 71 Establish of Standards for Water Conserving Devices (5/3/89)
- Ordinance 77 Hardship Exceptions to Adding Plumbing Fixtures (4/8/92)
- Ordinance 80 Amendment of Ordinances 64, 69 and 70 Water Conservation (4/14/93)
- Ordinance 85 Establish Water Conservation (delete old ordinances) (10/12/94)
- Ordinance 87 Amends Water Conservation (allows irrigation and vehicle washing) (2/15/95)
- Ordinance 91 Amendment of Ordinances 85 and 87 Water Conservation (8/22/97)
- Ordinance 94 Amendment of Ordinance 92 Water Conservation (10/15/01)

- Ordinance 95 Amendment of Ordinance 94 Water Conservation (12/12/01)
- Ordinance 96 Amendment of Ordinance 95 Water Conservation (8/14/02)
- Ordinance 97 Amendment of Ordinance 96 Water Conservation (1/8/03)
- Ordinance 98 Amendment of Ordinance 97 Water Conservation (8/11/04)
- Ordinance 99 Amendment of Ordinance 98 Water Conservation (2/9/05)
- Ordinance 101 Amendment of Ordinance 66 Moratorium on Water and Sewer Connections (12/14/05)
- Ordinance 102 Moratorium of the Issuance of Water Connections within the Boundaries of District (10/11/06)
- Ordinance 104 Adoption of Stage 1, 2, 3 for Water Conservation Procedures (6/10/09)
- Ordinance 106 Revision of Ordinance 104 Stage 1, 2, 3 for Water Conservation Procedures (10/14/09)

Critical ordinances include the first ordinance in 1986 that declared the serious water quality problem and issued a building moratorium citing the threat to public health and safety. In 1988, the SSCSD issued the permanent building moratorium which, to this day, is still in place. In 2005, SSCSD issued a Water Conservation Ordinance restricting the use of potable water based on the following three stages:

**STAGE ONE:**

1. Effective when the Pico Creek stops running to the ocean. To be lifted when Pico Creek starts running to the ocean.
2. Use of water from fire hydrants shall be limited to firefighting and/or activities immediately necessary to maintain the health, safety and welfare of the SSCSD.
3. All sales or use of SSCSD water outside of the SSCSD limits shall be discontinued.
4. SSCSD water shall not be used to wash down sidewalks, driveways, parking areas, buildings or other structures, except to alleviate immediate fire or sanitation hazards.
5. The washing of automobiles, trucks, trailers, boats, mobile homes and other types of mobile equipment with SSCSD water shall be prohibited.

**STAGE TWO:**

1. Initiated when current well field levels for three consecutive weeks drop 5% below monthly historical averages. Lifted when Pico Creek starts running to the ocean or when well levels return to average level for two consecutive months.
2. All outdoor irrigation of vegetation with potable SSCSD water shall be prohibited.
3. The use of SSCSD water for the filling, refilling or adding of water to swimming pools, wading pools, ornamental fountains or spas shall be limited to the amount necessary to keep the pool or fountain equipment operative and to refill for evaporative losses.
4. Restaurants are prohibited from serving SSCSD water to their customers except when specifically requested by the customer.

**STAGE THREE:**

1. Initiated when current well field levels over three consecutive weeks drop 12% below monthly historical averages. Lifted when Pico Creek starts running to the ocean.
2. All lodging establishments are limited to changing stay-over guests linens to every other day unless specifically requested by the guest.

3. The use of SSCSD water for construction compaction, concrete work or other construction needs is prohibited.
4. Water utility rates shall be subject to a 20% surcharge.

## **6.1 Project Description**

As per Exhibit E of the Proposition 84 Round 2 Proposal Solicitation Package, DACs are given special preference in permitting the study and planning of critical water supply or water quality needs. This project is submitted under the Expanded Project Eligibility allowance based on the DAC status of the SSCSD service area and the critical water supply, water quality, and water system improvements needed to provide safe, reliable drinking water and fire protection.

The physical movement of rainfall, surface water, groundwater and ocean water is not well documented, leading to uncertainty of which supplemental alternative water supplies can be developed to make up for the loss of SSCSD's water right of 140 AFY. Feasibility studies have not been performed over the entire watershed to see if there are "low-hanging fruit" opportunities to incrementally and cost effectively replace lost supplies; estimated, in this proposal, to be 50 AFY. As part of any study to introduce new water supplies to the existing (or planned, in the case of a recycled water source) water distribution system, a system model study will also be needed to identify capital improvements to convey the water and meet peak hour and fire flow demand requirements.

This project is proposing to assist the disadvantaged community, San Simeon, in bringing their critical supplemental water supply needs to the point of resolution where financing can be pursued for construction of the best alternative. The primary technical goal of this project is to find supplemental water supplies to increase SSCSD's safe and sustainable water supplies to average 140 AFY, their existing surface water entitlement.

The San Simeon Supplemental Water Supply Feasibility Study and Design Project (Feasibility Study) will recommend a comprehensive set of actions designed to supplement the available water supplies while simultaneously reducing subsurface and wave action salinity exposure, enhancing drinking water quality, and improving the vitality of the groundwater basin and overall watershed management. Initial baseline performance monitoring will be conducted in the study phase to better quantify benefits upon project implementation. It is the hope that this program is viewed as self-mitigating and will allow regulatory and permitting agencies to issue multi-year permits for the efficient implementation of the beneficial program components.

## **6.2 Project Benefit Definition**

As a Planning Grant rather than an Implementation Grant, required quantification of physical benefits requires the assumed implementation of the planning efforts where both water supply and system improvements are made. Taking this planning effort to the point where financing of a DAC critical water supply project is the only guarantee for implementation, assures that Federal, State, and local grant programs will fund all or a portion of the recommended project capital facilities over a modest period of time (within the next 8 years). The final beneficial

outcome will be 140 AFY of reliable water supplies, including the possible use of recycled water, treated and delivered via a DPHS approved water system. The capital program to support the recommended alternative capital project(s) provides the measure of quantified benefits to both water supplies and sufficient capacity in their existing water system shown in **Figure 2-21**.

## **6.3 Project Development and Selection**

### ***6.3.1 Relationship with Existing Water System***

With Project implementation, SSCSD will be capable of balancing water supply and demand for a growing community, possibly removing the 30 year building moratorium, while using standard water conservation best management practices. Most importantly, the supplemental water supply will meet the critical water supply and fire protection needs by making full use and improvements to the existing SSCSD water system.

### ***6.3.2 Selection Process***

In 2006, SSCSD investigated implementing a recycled water treatment system that would utilize effluent from the SSCSD Wastewater Treatment Plant (WWTP) as the recycled water supply<sup>36</sup>. Preliminary engineering was performed for tertiary filtration facilities and ancillary equipment sized to produce 200,000 gpd of recycled water, matching the existing WWTP's permitted dry weather flow. However, following preliminary engineering, the District determined that a full-sized recycled water system was beyond the District's immediate financial capability.

Since recycled water production alternatives sized to treat the permitted discharge were determined to be too costly for the District, the project was reduced to develop a small recycled water supply project that would: 1.) improve water quality of wastewater discharge, and 2.) provide future opportunities for beneficial reuse of the community's WWTP effluent. The small scale plant would utilize the SSCSD's Supplemental Environmental Project (SEP) funding for equipment purchase and construction of the treatment facility.

With RWQCB approval and construction of the first phase small scale recycled plant completed in 2012, SSCSD is operating a recycled water plant to meet wastewater discharge requirements. The planned second phase of work is being held back until the appropriate level of alternatives analysis and determination of overall needed capital improvements are completed to address the entire SSCSD (estimated 50 AFY) shortfall in their water entitlements and deficiencies in the water system. This grant proposal seeks funding to complete the required alternatives analysis and feasibility study.

## **6.4 Project Description**

The goal of this project is to complete a supplemental water supply feasibility study and subsequent design that accomplishes the following objectives:

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<sup>36</sup> Boyle Engineering. "SSCSD Wastewater Treatment Plan Tertiary Treatment Upgrade." 2006.

- Considers water supply opportunities across the entire watershed;
- Considers a variety of water supply sources including but not limited to groundwater and recycled water;
- Designs a project that delivers critical water supply, water quality, and water system improvements needed to provide safe, reliable drinking water and fire protection; and
- Allows the community of San Simeon to develop a project that ultimately allows the elimination of the building moratorium.

## **6.5 Project Physical Benefits**

The outcome of this grant request is a project definition which has the potential to benefit multiple San Luis Obispo IRWMP programs, including:

### **Water Quality Program (Water Quality)**

- Reduce and manage salinity intrusion into the freshwater aquifer of Pico Valley.

### **Water Supply Program (Water Supply)**

- Develop a capital improvement program to increase potable (and recycled, if recommended) water conveyance facilities and to meet peak hour and fire flow water demands.

### **Ecosystem Preservation and Enhancement Program (Ecosystem)**

- Protection measures to enhance surface water quality in Pico Valley watershed.

### **Groundwater Monitoring and Management Program (Groundwater)**

- Preparation of a groundwater model and management strategy to optimize the sustainable yield of the Pico Valley aquifer.
- Feasibility analyses for preserving natural groundwater recharge areas.

The resulting physical benefits of the study and project design will be the development of an estimated 50 AFY, addressing the critical water supply and water quality needs of a DAC, as quantified below.

## 6.6 Measurement of Benefits

Each of the quantifiable physical benefits is summarized in **Table 2-28** below. In summary, the key Physical Benefits include:

- Water Supply Benefits: Develops 50 AFY of critical water supply.
- Water Quality Benefits: Reduced chloride concentrations in drinking water supply during dry months and drought conditions to less than 250 mg/L.
- Water System Benefits: Increase water system pressures and flow to meet fire code compliance for commercial properties (Residual Pressure > 40 psi and Flow > 3,500 gpm).
- Groundwater Benefits: Increases overall groundwater storage, improved management and protecting the groundwater from increased salinity intrusion from subsurface influx of ocean waters.<sup>37</sup>
- Water Conservation: Contributes to less frequency of severe (level 3) water rationing.

**Table 2-28. San Simeon CSD Quantified Benefits with Project Phasing**

San Simeon Supplemental Water Supply Feasibility Study and Design Project					
Additional Information: Claimed benefit is tied to meeting existing annual average, maximum day, and peak hour water demands					
	Physical Benefits				
Benefits to:	Benefit Description	Unit of Meas.	Without Project(s)	With Project(s)	Change Resulting from Project(s)
Water Supply	Increase total sustainable water supply portfolio to 140 AFY	AFY	90	140	50
Water Quality	Maintain chloride (a measure of salinity) concentrations at or below the current Title 22 Secondary MCL of 500 mg/L	mg/L	>500	<250	>250
Groundwater	Increase in average groundwater elevations increasing natural storage and groundwater elevations	Ft, msl	<2	6	>4
<b>Comments:</b> Improvements will allow SSCSD to consider removing 30 year building moratorium					

Looking out over the four years after project construction (assumed to take place in 2016), the SSCSD project will begin to increase the quantity, reliability and quality of drinking water supplies. Reductions in high salinity events (reported as chloride concentrations) will decrease as part of improved basin management activities. Higher overall groundwater elevations and

<sup>37</sup> Introduction of salinity through wave action carrying salt water in to the terminus bay of Pico Creek in the summer months will not benefit from the Project unless the hydraulic connection of the river maintains sufficiently higher flows to avoid being cut-off by sand berms in the summer months.



reduced fluctuations of groundwater elevations between dry and wet months and back to back drought years will decrease in the foreseeable future.

**Table 2-29. Forecasted Annual SSCSD Project Physical Benefits – Water Supply**

San Simeon Supplemental Water Supply Feasibility Study and Design Project			
<b>Benefit Claimed:</b> Water supply			
<b>Measure of Benefit:</b> acre-feet per year			
<b>Additional Information:</b> Projected benefits result from Plan Implementation			
	Physical Benefits of Project Implementation		
Year	Without Project	With Project	Change Resulting from Project
2013	90	90	0
2014	90	90	40
2015	90	90	40
2016	90	110	20
2017	90	110	20
2018	90	130	40
2019	90	130	40
2020	90	140	50
Last Year	90	140	50

## 6.0 Measurement of Benefits

As a feasibility level of planning, a formal baseline monitoring program will be developed to fully capture conditions prior to project implementation. Performance beyond successful completion of the Feasibility Study will be measured after project implementation, not completed as part of this grant proposal. The baseline monitoring parameters will include baseline groundwater elevations measured in wells, water quality measured in wells and Pico Creek, precipitation, streamflow, surface water usage, surface water quality, land use to the extent differential uses impact water demands, measured groundwater pumping, estimated groundwater pumping and wastewater discharge and reuse.

## **6.1 Without Project Conditions**

Without the recycled water supply, the SSCSD would have to consider the following options:

- Maintain the building moratorium and allow high salinity events to severely constrain water usage,
- Making use of emergency wells in neighboring lands, and
- Importing potable and non-potable water via truck or trailer.

The most likely scenario without this project is a combination of maintaining the building moratorium and other conservation programs and utilizing the existing small well located in a neighboring boundary for emergencies only. Worst case would require no outdoor irrigation, reuse of gray water, and trucking in drinking water supplies when high salinity exists in supply wells and/or when system storage can no longer operate under safe fire protection guidelines.

## **6.2 Potential Adverse Physical Effects**

No permanent adverse effects will occur from the implementation of the Feasibility Study or project design. However, with implementation and delivery of the new supply, the community of San Simeon could choose to lift the building moratorium. Additional development could be viewed as adverse by no-growth advocates. However, these effects will be considered as part of any CEQA requirements for project implementation but not part of this phase of the project.

## **6.3 Project Contacts**

### **Water and Wastewater Services (SSCSD)**

San Simeon Community Services District  
Renee Samaniego-Lundy, APTwater Services, LLC  
111 Pico Avenue, San Simeon, CA 93452  
(805) 927-4778

### **Groundwater Basin**

Cleath-Harris Geologists, Inc.  
11545 Los Osos Valley Rd., Ste. C-3, San Luis Obispo, CA 93405  
(805) 543-1413

Fugro Consultants, Inc.  
Paul Sorensen  
660 Clarion Court, Ste. A, San Luis Obispo, CA 93401

Carollo Engineers  
7580 N. Ingram Ave., Fresno, CA 93711

## Chapter 3. PROJECT SYNERGIES

With cyclical droughts, declining groundwater levels, degradation of surface and groundwater quality, and the limited availability of surface water supplies, it is important for stakeholders in the San Luis Obispo County IRWM Region (Region) to effectively manage available water resources. Our focus on this orchestrated water resource management allows us to better protect the public health and safety, maintain viable ecosystems, improve water resources availability through optimization of supply sources, and improve surface and ground water quality to ensure its usability for generations to come.

To that end, the local IRWM Regional Water Management Group and stakeholders developed this San Luis Obispo Regional Integrated Water Management Proposal (Proposal), combining a suite of locally-vetted projects critical to the success of our regional water resource management efforts.

The Region recognized several critical local water resources needs:

- Stabilize the rapidly declining level in Paso Robles Groundwater Basin;
- Protect and enhance vital ecosystem resources; and
- Address critical water supply and quality needs of disadvantaged communities.

The San Luis Obispo County Resource Capacity Study (November 2010) found that the Paso Robles Groundwater Basin is at or near the perennial yield of about 97,700 acre-feet per year (AFY) – placing the basin at the most severe/critical planning designation. Parts of the basin have experienced **declining groundwater levels in excess of 70 feet** over a relatively short period of time: 1997-2009, and those levels continue to drop. Five projects in this Proposal help to reduce stress on the basin by bringing in new sources of water, optimizing use of existing entitlements, improving infrastructure related to water supply, and/or protecting water supply sources:

- **City of Paso Robles Nacimiento Water Treatment Plan** – Introduce 2.4 MGD of potable water to the City of Paso Robles users, thereby offsetting groundwater use by utilizing the existing, but previously un-used, 4,000 AFY entitlement to Nacimiento Reservoir water.
- **Shandon State Water Turn-out** – Access existing State Water allocation of 100 AFY of treated water for the community of Shandon, providing increased water supply reliability and relief to the stressed Paso Robles groundwater basin. Thus diversifying its supply so that, when available, State Water can be used in lieu of the groundwater basin, and vice versa – this ability to conjunctively use supplies will allow for periods of groundwater basin recovery, while not creating a dependence on State Water.
- **San Miguel Community Services District Critical Water System Improvements** – Ensure continued reliability of the minimum quantity of potable water delivered, augment inadequate water supply system pressure to prevent loss of system integrity and to maintain adequate fire protection flows and replace or rehabilitate water supply wells that have exceeded their useful life. Maintaining infrastructure reliability is critical as this community is solely dependent upon the basin for water supply.
- **Attiyeh Ranch Conservation Easement** – Protect 8,305 acres of lakeside property from future development, thereby protecting the land from excessive runoff consistent with development, and sustained groundwater percolation and retention of water in Nacimiento Reservoir to maintain historical beneficial uses.

- **Livestock & Land Program** – Educate the agricultural community on Best Management Practices to reduce their livestock facilities’ negative impact on surface water quality, thereby helping to institute behavioral changes that will lead to improved surface water quality for downstream users.

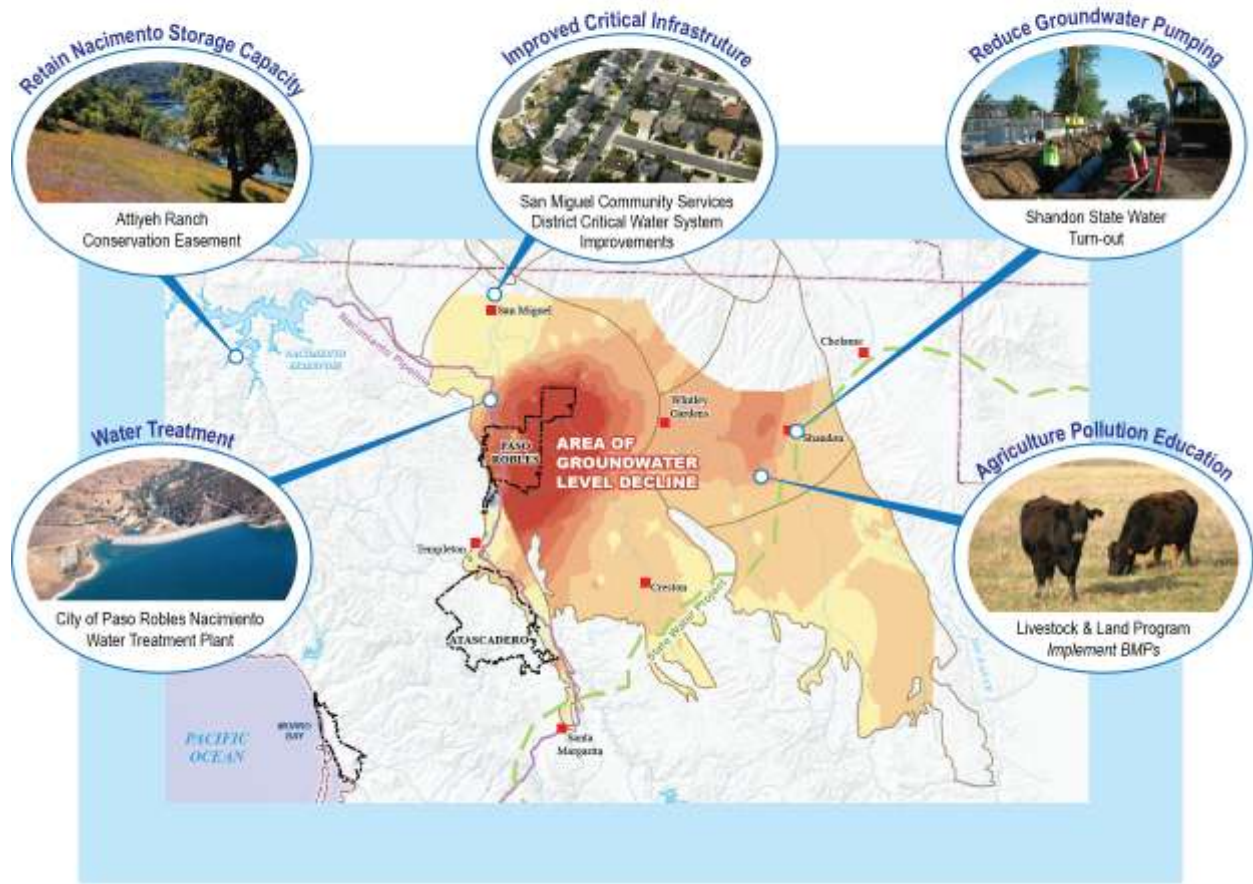


Figure 3-1. *Enhancing the Use of Water Resources: Relieving Stress on the Paso Robles Groundwater Basin.*

Regional stakeholders see the protection and enhancement of vital ecosystems as an elemental component of local resource management. This Proposal includes the Attiyeh Conservation Easement, which not only preserves water supply as described above, but also protects land with significant benefit to wildlife and the public by preserving its current limited, low intensity ranching practices, open space corridors, and stunning landscapes. The conservation easement will protect 8,305 acres in perpetuity from future development and will serve to “provide opportunities that bond people to the heritage, wonder and bounty of our county’s vital lands” via docent-led hikes. It will enhance quality of life by preserving landscapes that sustain the Region’s drinking water, fresh air, and wildlife.

Lastly, this Proposal seeks to help address critical water supply and quality needs in two local disadvantaged communities (DACs): San Simeon and San Miguel. DACs by their very nature of being low income areas have more difficulty funding and making resources available to identify alternatives to meet critical water supply and quality needs and to implement solutions to address those same needs. The San Miguel Community Services District (SMCSD) needs to implement projects included in this Proposal in the immediate future, or they face continued deterioration of an already deficient water system and may not be able to support even limited beneficial growth with the identified deficiencies that face the District's water system. The San Simeon Community Services District (SSCSD) identified the needed assistance to provide safe, reliable drinking water and fire protection. SSCSD is pursuing a \$700,000 supplemental water supply feasibility study and design project to increase safe sustainable water supplies from the small Pico Creek groundwater basin which is dependent on the local watershed to recharge and protect the basin each year, especially during extended drought conditions.

Grant funding of this Proposal will help the Region to implement projects critical to the success of our regional water resource management efforts.